

PYROLOGY;
OR,
THE CONNEXION
BETWEEN
NATURAL AND MORAL
PHILOSOPHY:
WITH
A SHORT DISQUISITION
ON THE
ORIGIN OF CHRISTIANITY.

BY WILLIAM OKELY, M. D.
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AMPTON, AND CORRESPONDING MEMBER OF
THE LONDON MEDICAL SOCIETY.

En libellum mole parvum, materiâ gravem.

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P R E F A C E.

SOME peculiar circumstances, which may perhaps be revealed to the sagacious reader in the progress of this work, joined to a disposition naturally thoughtful, and a keen relish for the investigation of truth, led the author to spend great part of his life in literary speculations. In the course of these speculations he was more than once stopped or perplexed by the contradiction of tenets, adopted without proof from the reigning philosophy of the day; so that at last he began to entertain doubts in regard to points, which till then he had been taught to consider as indisputable.

PREFACE.

But as to a reflecting mind suspense is always painful, he necessarily proceeded to examine into the origin of such assumptions, and to enquire what part of them were true, or whether upon certain subjects truth were not to be attained.

In the course of this enquiry many new ideas presented themselves, which, considering the caution he had used in his reasoning, the author could not but think true, but which still a due deference to the opinions of others forbade him to publish as certainties. So many crude notions are every day obtruded upon the public attention, that he was very loth on that account to trouble the world with his, till they should not only have been matured by reflexion, but every separate point

PREFACE.

point proved by that infallible test, experiment.

When however he considered the different faculties and opportunities of mankind, and in how many of these he was obviously deficient; when he remembered, that frequently an hint started by one man has been pursued by a second, completely proved by a third, and applied to some useful purpose by a fourth, he at last resolved to send his thoughts into the world with the best form and connexion he could give them, leaving them to stand or fall by their own evidence.



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INTRODUCTION.

WHOEVER thoroughly considers the present state of Science, will be convinced, that, notwithstanding the amazing improvements which have been made in particular branches, Philosophy itself, or the knowledge of those principles which are common to them all, is still far from being perfect. The explanations of many natural phænomena, given by learned men, are quite unsatisfactory; of not a few the explanation is never attempted; and of some to attempt an explanation, is considered as presumptuously overleaping the bounds prescribed by Nature to the

A human

human understanding, and incurring the guilt of impiety. In the present state of our knowledge, mechanics and chemistry, though exhibiting phænomena derived from one and the same *nature*, are yet totally disjoined, no one well-established law of the former applying with any precision to the latter. Between the natural and moral world the disunion is still greater, the real laws of the latter being as yet very little known.

It is owing to this defect, that every science, which depends immediately upon these general principles, is still so imperfect. The sciences of medicine and legislation have never yet been reduced to fixed principles, because both depend upon a minute physical and metaphysical knowledge of man, which has hitherto been very little cultivated.

The

The defect to which I allude, and to supply which, in part, I shall make an humble attempt in the following treatise, has been more or less felt by all philosophers who have carried their researches into the laws of nature to any length, upon independent principles. But different men have shewn their sense of it in different ways.

Some have utterly despaired of the human power, and given up the pursuit in disgust. Even the sagacious Sydenham* doubts whether the organ of human thought have the power of finding out

* *Haud satis scimus, annon vel totum hominum genus cerebrum cogitationum officinam habeant a natura ita efformatum, ut non tam quid sit absolute verum, quam quid maxime conveniens, ac suis naturis accommodatum, excogitare queant.*

SYDENHAM.

absolute truth, and whether it be not rather calculated for suggesting to every individual what is most conducive to his welfare. Others have written very elegant and learned treatises upon the defect, without taking any step towards remedying it*. One eccentric and well-known genius has condemned all learning and society itself in the lump. A few wiser than the rest have acknowledged the defect, and pointed out the proper means of removing it; but have declined doing more, as their own situation and views in life did not oblige them to undergo the fatigue, or encounter the peculiar difficulties, which never fail to attend upon enterprize and innovation.

If the impartial reader will peruse with attention the queries subjoined to Sir Isaac

* See Baker's Reflexions upon Learning.

Newton's

Newton's Optics, he will be convinced that Sir Isaac foresaw and hinted the probability, that at some future time a relation would be discovered between the more subtle parts of matter (as they are generally called) and the principle of sensation in animals; or in other words, that it would be possible to point out the connexion between natural and moral philosophy. He is even still more explicit at the end of the third book of his Principia.

The following passage in Locke's Essay on Human Understanding discovers plainly his sense of the necessity of a new philosophy :

“ To give beginning and being to a
“ spirit, would be found a more incon-

“ ceivable effect of omnipotent power.
“ But this being what would perhaps
“ lead us too far from the notions, on
“ which the philosophy now in the
“ world is built, it would not be par-
“ donable to deviate so far from them,
“ or to enquire so far as grammar itself
“ would authorize, if the common set-
“ tled opinion opposes it.”

To authorities so respectable it is almost superfluous to add that of the learned Dr. Smith, in his treatise on Harmonics. At the conclusion of his preface he has the following words:

“ As almost all sorts of substances
“ are perpetually subject to very minute
“ vibrating motions ; and all our senses
“ and faculties seem chiefly to depend
“ upon

“ upon such motions excited in the
“ proper organ ; *there is reason to ex-*
“ *pect*, that the theory of vibrations here
“ given will not prove useless in pro-
“ moting the philosophy of other things
“ besides musical sounds.”

The ingenious Dr. Hartley's work on Man contains not only throughout an acknowledgment of the present defective state of philosophy, but is itself one of the few attempts that have been made to improve it. Unfortunately experiments had not been sufficiently multiplied in his day, to afford him such a number of data as could enable him to build his system on a solid foundation, though even in its present state it has great merit. That he had some prejudices to conquer, when he entered upon the work, the author

himself allows ; and others will be discovered by the discerning reader, of which he seems not to have been sensible.

Had Mr. Hume happened to be bred to physic, instead of the law, there is little doubt but he would have executed what I am now undertaking, in such a manner as to have made it presumption in me to have appeared in the same field after him*.

* I hope what I have said will not be thought to proceed from an undue partiality to my own profession. The frame of man is the proper study of a physician, and in an attempt to investigate with accuracy the human powers, the education of a physician cannot but afford him considerable assistance. Locke and Hartley were both physicians.

I am

I am not so vain as to flatter myself, that every part of the following outline is drawn exactly according to truth: this however I can assure my reader, truth has been my only aim; and considering the time and pains employed in the search, I must have been wonderfully unfortunate not to have sometimes attained it.

SECTION



SECTION I.

*On the First Principles of Nature in
general.*

IT would be a superfluous attempt to prove the existence of an external world, had not some very respectable philosophers lately shewn, that by subtle reasoning it may be rendered problematical *. The simple reason, however, why we assent to the existence of things without us, is the facility with which that hypothesis explains every phænomenon that can occur to a sentient being, without a single exception : for though many

* Berkley, Hume, Buffon, &c.

others

2 ON THE FIRST PRINCIPLES

others may be started, yet they are all either big with contradiction, or require such an accumulation of circumstances upon one point of space, as to become highly improbable.

I look upon the reasoning of Berkley, Hume, &c. by which the existence of an external world is rendered doubtful, as so many *argumenta ex absurdo* against the first principles of our present philosophy. Every action of our lives shews that we are *convinced*, that there are things without us, and the effect of almost every action of reasonable men in ordinary life shews, that we are in the right to be so. Yet by assuming the first principles of our philosophy, and reasoning from them in the most cogent manner, the matter becomes doubtful. But those

those premises, from which, by just reasoning, an absurdity may be deduced, must be themselves erroneous.

Ergo—Q. E. D.

Idem alio modo.

Buffon, in tom. iv. of his Natural History, near the beginning of his Hist. Nat. de l'Homme, uses the same mode of reasoning with Hume, &c. and though he stops short of the above-mentioned revolting inference, yet is he forced to conclude, that if there be an external world, its appearance must be very different from what we conceive of it. Nor is he there speaking of the speculations of philosophers, whose privilege it has been ever since the days of Cicero to be absurd with impunity, but of such things as fall within the sphere of common life, common experience, and common actions. Now as our usual success in the ordinary experiments

4 ON THE FIRST PRINCIPLES

experiments of common life shews us, that not only we have an external world to work upon, but that those parts of it, which individuals of common sense have thoroughly studied, are very nearly in reality what they take them to be; the *argumentum ex absurdo* recurs again as before. Q. E. D.

That the reader may fully comprehend the force of this remark without much extraneous searching, I shall here subjoin and contrast the arguments of Hume and Buffon.

HUME's ARGUMENTS.

1. All perception is in the mind.
2. We perceive external things by the mind.
3. External things are material.
4. *Matter and mind have nothing in common.*
5. Therefore the perceptions of our mind cannot arise from any thing material.
6. *Ergo*, they cannot arise from the action of an external world.
7. *Ergo*, we can have no proof from our perceptions of the existence of an external world.

Q. E. D.

BUFFON's ARGUMENTS.

1. All perception is in the mind.
2. We perceive external things by the mind.
3. External things are material.
4. *Perception does not resemble any thing material.*
5. *Ergo*, our perceptions are not like any thing without us.
6. *Ergo*, the external world is not such as we conclude it to be, from our perceptions.

Q. E. D.

By

By our feelings we are first informed of our own existence, and from our feelings we learn that there exist things besides ourselves *.

It has been hitherto usual to suppose, that the sentient principle in man has nothing in common with the inanimate part of nature; and yet that these two substances act mutually upon each other. But this to me appears a direct contradiction. That mind and matter (to use the common terms) act upon each other cannot be denied; and though the modest philosopher is forced to confess, that the nature of their connexion is still unknown, yet the fact that there is a

* It will be perceived, that I here dissent from Des Cartes, who gathered his existence from his thinking; but we certainly feel before we think.

6 ON THE FIRST PRINCIPLES

connexion ought not on that account to be denied. Perhaps the late rapid progress of experimental philosophy may make it easier now than it was formerly, for an impartial reasoner to discover that connexion.

An attempt of this kind must be allowed at least to afford a prospect of great improvement. We know a little of ourselves, and a little of the world without us. But as our happiness depends, in part at least, upon external agency, we shall be enabled to ensure a greater share of the former, as we become better acquainted with the laws of the latter. Besides that the study of nature is itself a source of pleasure to inquisitive minds, increasing in proportion to the progressive improvement of human knowledge.

CHAP.

CHAP. I.

An Analysis of Inanimate Nature.

UPON a comprehensive survey of all natural objects, such as the present improved state of natural knowledge will enable us to take, let us try whether we cannot come to some result, that may be applicable to the purposes of the work we have in hand.

Almost all bodies are expanded in their dimensions by heat, and contracted by cold. While expanding, they gradually grow softer or more penetrable; while contracting, they grow harder

B

or

or less penetrable, and both in a proportion far beyond that of their expansion or contraction respectively. From all which we infer, that they consist of particles and pores, into which last the heat entering, sets the particles at a greater distance in the one case ; or from which retreating, the particles are pressed closer to one another, in the other case.

It has formerly been the subject of dispute, whether heat were a substance or a quality. But before I proceed farther, I must endeavour to clear up those two ideas.

Of Substances and Qualities.

IT is not my intention to disgust my reader with a perplexed disquisition upon things, which exist only in the human
imagina-

imagination ; like those that occupied the attention of mankind, when the profound knowledge of Aristotle had degenerated into the senseless dreams of scholastic theology.

We perceive by our senses that changes are constantly taking place in the world around us. But every such change implies either an addition or subtraction of something ; or without either addition or subtraction, a difference of arrangement brought about in that part of nature which we are surveying. When any change is supposed to depend upon addition or subtraction, the cause of that change is said to be a substance, when upon difference of arrangement only it is called a quality.

B 2

Thus,

Thus, when out of a piece of glafs I make a mirror, the difference in the phænomena exhibited by the glafs is owing to the addition of a new substance, mercury: but when with the same glafs I produce the phænomenon of *sound*, I add nothing to it, but only throw its particles into a peculiar kind of motion. The cause then of the increased reflexion of a mirror is a substance; the cause of the sound of glafs is a quality.

Thus likewise, when by impelling a billiard-ball which was at rest, I set it in motion, no man ever suspected that the difference in the phænomena depended upon any thing added to the body, which addition was the cause of motion: motion therefore was always supposed (and justly)

justly) to be a mere quality of substances, and not itself a substance.

But when, on the other hand, I perceive no increase of my own heat by the contact of a body at one instant, and afterwards by some change wrought in it, find that it does encrease my sensations of heat, philosophers were formerly in the habit of attributing this difference to some supposed difference in the motion of the particles only. At present, however, we find the phænomena agree much better with another supposition, to wit, that whenever any body has its temperature changed, whenever (to speak in the ordinary phrase) it becomes either hotter or colder, that then there are in the former case added to the body, and in the latter taken from it particles of ex-

istence of a distinct kind, calculated to excite in a sentient being sensations of a peculiar kind, those to wit of cold and heat.

To this substance I shall give the name of *Calorique*; and as it is the leading idea in the theory now submitted to the public, it was necessary to clear it up to the reader as much as possible from the first.

In the course of this chapter I have been under the necessity of employing two words, upon which it may be proper to say something farther. The words I mean are, *philosopher*, and *cause*; of which though the import is generally conceived to be well known, I think it not superfluous to employ a distinct chapter

chapter upon each. Accordingly, the next will treat upon cause and effect, and the following one upon the best mode of philosophizing.

CHAP. II.

On Cause and Effect.

WHEN two natural units, A and B, act upon each other, they are both changed from what they were before action: but it is usual to attend to the change produced in one only, and to call that change the effect, while the other agent gets the name of the cause.

Thus when a pebble impinges upon a piece of glass, and breaks it, the pebble as well as the glass undergoes a change; but that of the pebble, being imperceptible, is disregarded, and the pebble is
said

said to be the cause of the fracture of the glass.

When an animal body, or to be more particular, when an human body is one of the units, the same cause does not apparently always produce the same effect; the unit in which the effect takes place, *viz.* the human body, being in fact acted upon by other causes, as well as that to which our attention is chiefly turned, which have their share in producing the effect. Thus the same man shall go to the bed-side of a patient ill of a fever one day, and receive no injury; the next day he goes, catches the infection, and dies of the disorder. Here the same cause, *viz.* the same contagion, operating seemingly on the same man, produces different effects.

But

But in reality the man is *not* the same. The second day he came previously weakened, either by fasting or by excess, or by evacuations, or by other causes, and in consequence of that preparation was attacked by a fever; the contagion being in the instance given supposed not strong enough to produce its effect, except upon a *weakened* man.

This distinction being more evident in animal bodies than in other subjects, and those being the principal objects of a physician's attention, the art of physic has therefore, in speaking of causes, adopted a particular phraseology, which ought, however, not to be confined to that art; as it will apply (and usefully too) to every other department of philosophy. As I mean occasionally to employ

ploy this nomenclature, I shall here shortly explain the particular terms of it, illustrating my explanation by the example of a fever, as mentioned above.

By a natural phænomenon, we mean the signs by which a change that has taken place in a natural unit is known. Thus the several symptoms of a fever, well known to physicians, as, quick pulse, general uneasiness, &c. *taken together*, constitute a phænomenon. In the same way, the change from rest to motion in one billiard-ball, by impulse from another, is a natural phænomenon.

Whatever has any share in producing or in modifying such a phænomenon, is called in general a cause. In the instances alluded to, the contagious effluvia,
the

the evacuations, the different state of the nervous energy, circulation, &c. from the healthy state, are all causes of the fever. The quantity and direction of motion of the billiard-ball A, and the *vis inertiae* of B, are causes of the quantity of motion of the ball B, after impulse, and of the direction in which it moves.

The cause, which exists without the unit, in which the effect takes place, and which gives, as it were, the finishing stroke to the effect, is called the occasional cause. In the instance of fever, contagion is the occasional cause. In the instance of the billiard-balls, the motion and impulse of the ball A is the occasional cause of the motion produced in B. That which prepares the unit for
the

the action of the occasional cause, is called the predisposing cause. The several debilitating circumstances mentioned in that instance, are predisposing causes of the fever. The *vis inertiae* of the billiard-ball B is the predisposing cause of its motion. In this case, it differs not from its natural state, and is therefore in general neglected. The occasional and predisposing causes considered collectively, or in contra-distinction to others, are called by one name, remote causes.

The ultimate change which ensues in the internal structure of the body, after the operation of the remote causes, which is seldom completely known, and only to be found out by cautious reasoning and judicious conjecture, is called the proximate cause. The proximate
cause

cause of fever is not accurately known, either to physicians or philosophers. I shall have occasion to say more upon the subject in another place. Of the motion of a billiard-ball the proximate cause has never been investigated. My own view of the matter may be seen under the head of *Motion*.

It may be proper to apprize such of my readers, as are in the habit of looking into books of physic, that ordinary medical writers are apt to employ these terms with some degree of vagueness and inaccuracy, and to assure them, that whenever I employ them, I shall always adhere rigidly to my own definitions.

CHAP. III.

On the best Mode of Philosophizing.

Two methods have been practised by mankind, in their attempts to explain natural phænomena, or to find out the relation which nature in general bears to the nature of the human species in particular. The one was followed by the ancients; and as Aristotle pursued it the farthest, and most successfully, we shall frequently call it the Aristotelian method: the other was invented by the famous Bacon Lord Verulam, and may be termed the Baconian.

I shall shortly describe the nature of both these methods, and then point out their several advantages and disadvantages.

The Aristotelian mode of philosophizing consists of two stages, which I shall call observation and composition. By observation, under which I comprehend judicious reading, or treasuring up the observations of others: by observation a large stock of facts is accumulated in the brain of the philosopher. By composition this stock is afterwards sorted or arranged, according to their agreement or disagreement, so as to form a smaller number of general truths, each including a great number of particular ones. This method is peculiarly adapted to moral philosophy, most of the facts necessary
in

In the cultivation of that branch being easily procured, as they require nothing but attention to a man's own thoughts and feelings, and to the ordinary occurrences of life; while natural philosophy, on the other hand, must collect its facts from an extensive survey of nature; a survey not to be taken without great expense, much travelling, and the united endeavours of ages. What chiefly hinders the success of men in the cultivation of moral philosophy, is their prejudices, passions, and interests. The two latter, passions and interests, totally incapacitate all who are engaged in the active scenes of life for the undertaking. And even those philosophers, who unite leisure, coolness, and impartiality, find it extremely difficult to get the better of prejudices imbibed in early youth, from that

part of their education which they received at the will of others, before they themselves had arrived at years of discretion. Yet we shall have occasion to shew, in another part of this treatise, that there are defects in moral philosophy arising from another source, which can only be supplied from natural knowledge, and which must continue to exist, till peculiar circumstances have enabled men to carry that branch to a very high degree of perfection.

Towards the perfection of natural philosophy, the other method alluded to, I mean the Baconian method of philosophizing, is absolutely necessary, and that for two reasons. First, as the relations, which this branch of philosophy considers, are those of bodies without us,
they

they must be found out by patient observation and experiment ; and it is the use of experiment chiefly, which constitutes the Baconian method, and distinguishes the modern philosophers from the ancient. Secondly, it is the object of every useful philosopher, not only to investigate truth, but also to propagate it when found ; which supposes the art of demonstrating. Now, though single truths, immediately applicable to practice, may be properly enough inculcated by the *argumentum ad homines*, that is, by discovering and pointing out to men a connexion between their present belief or wishes, and between the new truth to be inculcated ; yet with respect to fundamental truths and new systems this is not the case. Here we are under the necessity, either of tracing a clear connexion be-

tween the new truth, and other undoubted ones, (which supposes the pupils to have philosophical minds,) or we must produce some striking effect, not to be produced without admitting the principle which we wish to demonstrate. Thus we see, that experiment is equally necessary for the discovery of natural truth, and to convince mankind, that what we have discovered is really true. A genuine Baconian philosopher is led, by speculating upon what he already knows, to the suspicion of new truths; and has recourse to experiment, that he may discover, whether his suspicions were well or ill founded.

This method is tedious but certain; the Aristotelian is far more expeditious, but, except in the very best heads, liable
to

to great uncertainty and error ; and even in the best highly precarious.

We may, however, with confidence look forward to an event, which will have a tendency to add certainty to the Aristotelian method, and dispatch to the other. The event to which I allude, is the perfection of the moral and phyfiological sciences. For, as all our knowledge of nature must pass through the medium of our own faculties, it is evident how much a perfect acquaintance with the latter must add to the authority of our first suspicions upon things without us. It is the imperfection of moral knowledge which makes conjecture often shoot so wide of the mark. As the science of morality improves, there will be less and less occasion for having re-

course to experiment. A time may even possibly come, when those who devote themselves to philosophy, will find their intuitive sagacity equally to be trusted with the slowest and most cautious march of our present experimentalists.

Meanwhile, we shall go the greatest lengths in promoting the knowledge of nature, not by adhering altogether either to the Baconian or Aristotelian methods. Keeping to the latter, is like setting about an edifice without materials; an exclusive attention to the former, is like leaving materials, that have been piled on an heap, to perish for want of an architect to construct the building.

Both methods must be united to produce the greatest effect. No doubt a certain

tain accumulation of materials is necessary, before we can do any thing to the purpose: but we should be careful to employ them before the heap becomes so unmanageable, that the architect is at a loss to find what he wants, at any particular moment, amidst the undigested chaos.

But all this is metaphor: what is the interpretation of this *building*? To build in science, is, by the force of our imagination and reason, to follow up a number of facts, the more the better, provided they can all be comprehended at one glance, into all their possible consequences, without any regard to the strangeness of the result, shunning nothing but absurdity; by which I mean, not inconceivableness, but contradiction;

for wherever that appears, we may take for granted that we have reasoned amiss,

To this it will be objected: are we not doing so; are we not drawing general conclusions from particular facts? You do it in some measure, but you go not far enough; you ought not to be content with drawing some *one* general conclusion from a number of particular facts; you should draw all that can be drawn. This is indeed *building*; your proceeding is at best but hewing and polishing the timber and stones for future use; but you still leave them to perish, for want of being united into the proposed fabrick.

Much mischief is frequently done in philosophy, by the misapplication of the
best

best rules. I know not whether the caution of Sir Isaac Newton against multiplying causes has not done more harm than good ; at least it has been my lot more frequently to hear it misapplied, than quoted properly. Nothing is more common in nature, than to see several substances, by their joint operation, conspiring to the production of one effect. Yet no sooner has some petty philosopher discovered any substance, of which the operation has a tendency to produce a certain effect, the subject of examination, than he boldly enters his protest against any farther enquiry ; adding with great gravity, that Sir Isaac Newton has prohibited the multiplication of causes unnecessarily. Sir Isaac has in fact done no such thing ; nor had he either the power or will to do it.

To

To exemplify the fault I am censuring by a parallel process in ordinary life: Suppose a tradesman to be weighing off a quantity of any kind of goods, and that some friend, upon whose judgment he has reason to rely, bids him beware of throwing more weights than are necessary into the opposite scale: if our tradesman, upon casting in the first weight, and finding it affect the balance, should appeal to his friend's warning, and refuse to add another, he would be guilty of just the same kind of absurdity with the mistaken philosopher above-mentioned.

Newton's grand law of philosophizing is in fact the following: In the explanation of phenomena, no more substances ought to be introduced, than what are

I. Proved

1. Proved to exist;
2. Adequate to the production of the phænomena both in
 - a. Kind and
 - b. Degree.

Upon the subject of power, as differing in kind, I shall have occasion to speak hereafter. In the mean time, let me observe, that no man has a right to object to an additional cause proposed for the solution of any phenomenon, till he has proved, that those already admitted are sufficient for its production in *degree*, as well as kind.

But while I readily own, that these three requisites are not to be dispensed with, in order to establish incontrovertibly the agency of any substance in the production of a natural event; I yet think,

think, that very strong presumptive proofs of such agency may be had, even before the agent is sufficiently known, to admit of its being measured, provided it be certainly existing, and adequate to the production of the effect, as to kind.

Before we can proceed to the exact measurement of any agent, its nature must be already very well ascertained, which requires a great length of time, and much previous comparison with facts.

In the mean time, a more superficial kind of measurement may be admitted, with respect to which, if the agent tally with the effect, it will at least serve to add weight to the proofs, till accurate calculation shall be applicable,

Thus the agency of a substance proved to exist, and endowed with powers adequate to the nature of any phænomenon, will be rendered highly probable, if we find the effect to be uniformly increased or diminished by the increase or diminution of the agent; though the precise quantity of such change may not be assignable either in the cause or in the effect.

The true art of philosophizing, is the art of decyphering nature. Till every part of nature is thoroughly investigated, that cypher is the best, which goes the farthest in explaining well - established facts. It is true, that because a cypher makes sense of a decyphered work, it is not on that account necessarily the true one; but yet the more complicated the
work,

work, and the better the sense made out, the more certainly it is the true one. I design this book as no more than an humble attempt to decypher nature; and if she admits of more than one sense by as many different cyphers (which however I am inclined to doubt) let *mine* be only one of them; I am content, till some other is found to be preferable.

The Copernican system of the world, and most other comprehensive discoveries respecting the true power of nature, were at first lucky hypotheses, or happy suggestions of inventive minds; such however as, being well founded, have stood their ground, and are now so thoroughly established, that they will never again be called in question.

CHAP. IV.

Sequel on Calorique in Inanimate Matter.

I SHOULD now proceed to follow that powerful agent *Calorique* through all its operations in the various objects by which we are surrounded ; to shew how it produces all the grand phænomena of nature ; how by its preffure on the upper surface of bodies, it causes them to gravitate, while upon other occasions it acts in the contrary direction, and by its presence renders bodies lighter than they otherwise would be ; how by its preffure on the surface of bodies in general, or on the external surfaces of particles, it produces

duces the cohesion of solids ; I should go on to trace its operation in the refraction, reflexion, and inflexion of light, with many other instances of agency, too numerous to be specified, but highly interesting to all those whose curiosity has been roused by the stimulus of leisure and a liberal education.

But as the detail of all these subjects would lead me into a field much too wide for the limits of this piece, I must with reluctance wave the discussion of them for the present, and hasten to matters of more general interest ; matters which will, unless much obscured by my manner of treating them, come home to the business and bosoms of almost every reader.

Yet,

Yet, as the examination of the above-mentioned points is not only thoroughly completed in the author's mind, but, for the most part, already prepared for the public eye, the connexion of some of them with the remaining parts of this work, will oblige him to introduce them; and of others an outline shall be exhibited by way of specimen, to enable the sagacious reader to form a judgment of the rest; and probably to induce persons of superior talents to anticipate them, or even to outstrip the author in similar researches.

CHAP. V.

Introduction to Chap. V. and VI.

As I think it extremely probable, that at some future period both physics and metaphysics will be reduced to the precision and certainty of mathematical demonstration, I shall in the following two chapters present the curious reader with a rude sketch of the method in which philosophical discussions will then be prosecuted, and some of the first principles upon which the elements of physics will probably be constructed.

These two chapters, however, being in some measure detached portions of
another

another work, while the more popular part of the present is, I hope, intelligible without them, though certainly likely to receive light from them, those to whom they shall appear too abstruse, may proceed at once to the eighth chapter.

CHAP. VI.

First Principles of Improved Physics.

AXIOM.

POWERS in equilibrio produce *rest*.

AXIOM.

Powers not in equilibrio produce motion, till equilibrium is restored.

OBSERVATION.

Different quantities of space equal to each other, contain different quantities of power.

AXIOM.

AXIOM.

The different quantities of power contained in different equal spaces, may be measured by the number of supposed powerful points in a given space.

OBSERVATION.

A certain mean concentration of power constitutes a substance, which in its different quantities gives to men the sensation of heat in various degrees.

As this substance is well known, very common, and probably the least concentrated state of power with which we are acquainted, we may take it for a standard of other powers.

To this substance I give the name of *Calorique*.

As the particles of all other substances known to us consist of power more condensed than it is in the particles of *Calorique*, any given particle may be considered as made up of a certain number of particles of *Calorique*.

THEOREM.

The denser any substance is, the less easily, but the more forcibly, it is liable to be acted upon: and *vice versa*, the rarer any substance is, the less powerful need a cause be by which it is to be excited into action, but also the less forcible will such action be when excited.

CHAP.

C H A P. VII.

On Power and Infinity.

W HATEVER we perceive in nature, if reduced to its most general terms, will come under the denomination of power or force.

Power may be represented by points, the degree of power by the number of such points contained in a certain space. See fig. 1.

Let the two circles A and B represent two equal spaces. If the number of powerful points in A be such, that each diameter every way may have four of them ;

D 4

the

the number of the same points in B such, that the number of equal points in every diameter may be eight; the power of A will be to that of B as 16 to 64, *i. e.* as 1 to 4; and whatever effect A will produce, B in the same circumstances will produce four times the effect.

Power seems to be necessarily existent, and to exist necessarily in every possible degree from infinitely great to infinitely little. But as we can only know the degree of any given power by experience, we have little to do with those extremes, but may content ourselves with investigating those degrees of power which fall within our view, and to which our own are in some measure commensurate.

I here

I here speak of absolute power : for there is no one finite power, which, with respect to certain others, is not either infinitely great or little,

The meaning of infinitely great or little is this : there is only a certain degree of minuteness and size to which our senses extend ; beyond that the most unequal things to us are equal. Thus, if I shake a powder-puff against St. Paul's church, there is no doubt that I have increased its dimensions by a determinate quantity of matter ; but by how much it is utterly out of my power to determine ; because in objects so large, I do not distinguish such minute differences ; and were I to attempt to determine the ratio which the powder bears to the whole building, I should be stopped

ped immediately by the impossibility of determining the magnitude of the church, as its dimensions would be increased and lessened a thousand times during my operation, in a way that baffles calculation, by quantities much greater than that with which I am to compare it. To *us* then St. Paul's church is infinitely greater than the quantity of powder contained in a puff; and *vice versa*, the powder infinitely less than the church. But perfect intelligence may know in every instant the exact accession and diminution, and the proportion which each bears to the whole.

Before I conclude this chapter, I shall present my reader with a curious mathematical paradox, which was, I believe, first discovered by Leibnitz. It shews us
how

how by substituting one species of power for another, a more manageable one, for one that lies out of our reach, we may arrive with certainty at the most astonishing results.

Let us substitute for infinite power, infinite number, which mathematicians mark thus, ∞ ; for *want of power* a number less than any finite one, to wit, 0.

Any number whatever, divided by an integer less than itself, gives a quotient less than the dividend; any number divided by unity, gives a quotient equal to the dividend; any number divided by a fraction gives a quotient greater than the dividend, in the same proportion as the divisor is less than unity. When the di-
visor

vifor becomes 0, the quotient will be 00; therefore 00 multiplied by 0, is equal to the dividend. But the dividend is optional. Therefore 00 multiplied by 0 is equal to every possible number.

Hence infinite power acting upon nothing will produce every thing possible, which we know to be true in fact.

CHAP.

C H A P. VIII.

On Particles.

THE particles of bodies are composed of the same powerful points, as the interstitial *Calorique*, but generally contain an infinitely greater number in a given space, so that Fig. 2. may be considered as a representation of any ordinary body, such as it would appear to a visual organ, capable of being acted upon by the particles of *Calorique*, as our eyes are acted upon by the particles of light. Such figures my reader must endeavour to carry along with him in his imagination, in order to his understanding me ; and for the assist-

ance of more sluggish conceptions, I shall frequently depict my own in figures.

But it may happen that the interstitial *Calorique*, as in the diamond, is of a density not greatly inferior to that of the particle. Hence it becomes necessary to add, that the chief difference between *particular* and interstitial *Calorique* is, that the latter receives its unity and stability principally from confinement; the other from another cause, which it is unnecessary now to examine into.

CHAP.

CHAP. IX.

On Cohesion.

IN general, heterogeneous substances have a greater tendency to approach, associate, or unite, than homogeneous ones.

The following are proofs of this assertion:—

1. It is plain from what takes place in all solutions, as in that of salt by water. The particles of salt and those of water, respectively, are homogeneous among themselves, but heterogeneous with respect to one another. But after solution, if agitation have been used, you
do

do not find water distinct and salt distinct ; but the smallest integrant part of the solution is both salt and water ; so that no particle of salt exists, but has with it a particle or particles of water.

2. In diffused mixtures, whether by agitation, as in mixing powder of bark with water, or by trituration, as in emulsions, the same takes place, with only this difference, that it is not so permanent.

3. But my chief argument is this :—
Let two kinds of powder, as cinnabar and magnesia, be agitated together by rubbing in a mortar, and they will presently associate so accurately, that no particle of one can be seen, or perceived by its effects, without such a portion of the
other,

other, as shall make the proportion of the ingredients to each other, the same in any part as it is in the whole.

Now in all these cases, the agitation can do no more than suspend and balance the force of gravitation; the arrangement must be entirely the effect of superior or elective attraction. In the instance of solution, this attraction is so powerful, as to take effect in opposition to gravitation, even while that power continues unbalanced. What then occasions the cohesion of solids, consisting of homogeneous particles?

Principally the pressure of denser *Calorique* without the body against rarer
E within

within it. To this is joined another cause, to be mentioned in the next chapter.

CHAP.

CHAP. X.

Unity in Nature.

WHEN we contemplate the various objects of nature, we cannot but observe certain masses, which are considered each as constituting a whole. Thus a man, a horse, a dog, a pebble, a bit of gold, are each units, distinct from the rest of the universe. It may be worth our while to enquire what it is that constitutes this unity. It is certainly not mere juxtaposition of particles. Two pebbles placed by each other are never taken for a large one. It is not mere accretion. Two small diamonds joined

E 2

by

by means of any other substance, would never pass for *one* large one. Suppose a piece of glass to be broken into two; the broken surfaces are smooth, and apply to each other with the greatest accuracy; yet you may put them together, and press them against each other with any degree of force, they will never again unite to form *one* piece of glass. But if you melt them together, that is, add *Calorique* till the repulsion of their particles becomes equal to their attraction, which constitutes a fluid, they will, while confined, form *one* fluid; and if suffered to cool with the proper precautions, that is, if you again gradually draw off the additional *Calorique*, they will at last concrete into *one* piece of glass, as before.

From

From this common experiment, but which, like many other common experiments, has not yet suggested all the inferences that might be drawn from it, we must, I think, conclude, that it is the continuity, and a distribution in some measure equable of *Calorique*, which renders any mass or body a natural unit. I say a distribution in *some measure* equable, because I mean not to say, that in a body so constituted, the *Calorique* must be every where of the same density ; on the contrary, I have other reasons for thinking that it is not so ; but that the difference of density must be gradual, and without sudden leaps ; or, which is the same thing, that it must be distributed according to some certain law.

CHAP. XI.

Cohesion of Masses.

THE theorems which flow from the preceding experiments, *viz.* 1. That the distribution of *Calorique* constitutes the unity of masses; and, 2. That the attraction of heterogeneous particles is superior to that of *homogeneous* ones, prove,

That as in masses, such as a piece of gold, or a diamond, the particles *are* homogeneous, their union to form one system is not owing to their attraction for each other, but to the distribution of the *Calorique* which fills up the interstices of
the

the particles, in conjunction with the external pressure mentioned in Chap. IX.

Upon the proportion which these two modes of cohesion bear to each other depends the difference of solids, such as hard, soft, brittle, ductile, malleable, &c.

CHAP. XII.

On Motion.

THE obstinacy with which a body in motion, whether it have derived that motion by communication from another body, or from some other occasional cause, continues to move with the same degree and direction of force, till opposed by one equal and opposite, or determined to move in another direction by combination of motion, naturally leads us to look for a considerable part of the cause of motion in the moving body itself. In that body we are to seek for the predisposing and proximate causes.

What

What it is in any body which gives the predisposition to motion ; how that predisposition is converted into the proximate cause, when motion really takes place, and what that proximate cause is, are questions which have never been answered ; questions, however, the answers to which must in the first instance gratify our curiosity in a high degree, and would probably ultimately be productive of the greatest practical utility.

In order to discover the proper answer to them, we shall proceed most safely, if we consider, first, some of the most striking concomitants of motion, and enquire how far they may throw light upon the nature of motion itself ; then examine whether any principle so acquired be consonant with the ordinary phænomena

nomena of motion and its known laws ; and lastly endeavour, by the new principle so discovered and confirmed, to explain some of the less familiar cases of motion.

Let us then, in the first place, consider some of the most striking concomitants of motion, and enquire how far they may throw light upon the nature of motion itself.

All motion, it is well known, proceeds naturally in the direction of a right line ; even in circular motions, which at first would appear to contradict this universal position, we find upon a nearer enquiry, that the single particles of the moving body are every moment making an effort to proceed straight forward, and

are only prevented from doing so by a superior force, which draws them every instant towards the centre.

That it naturally proceeds in the direction of a right line, is then the most striking concomitant of motion.

There is no self-evident idea to be formed of the cause, why a body, which now exists in one part of space, should the next instant exist in another, except by attributing it to inequality of pressure. In the case of gravitation, there is really, as we shall see, a greater pressure on that surface of the body, which looks from the earth, than on that which looks towards the earth.

When

When any body is impelled, the equilibrium of pressure, which before existed, is taken off in one direction; but this inequality of pressure is produced in the moving body itself, by the impulse, and cannot be taken off but by an equal force, impressed in a contrary direction.

C H A P. XIII.

*Apology of the Author for imperfect
Arrangement.*

IT is time for me to apologize for a defect in this treatise, which every reader of discernment must long ago have observed, and which many a one I fear will have found extremely unpleasant. I mean the want of that lucid arrangement, which beginning with the most simple propositions, and proceeding to such as are more complicated, tends, by making the subject open gradually upon the reader's mind, greatly to facilitate his comprehension of it.

Such

Such an arrangement I have always wished to accomplish, but, after many trials, have found it impossible, without a much greater expence of time than at present I can possibly afford.

The articles were composed separately, after distinct investigations of the subjects they contain, and although the result of all these investigations seemed to establish the universal agency of one substance throughout all nature, and therefore the different parts of the work will be found, upon examination, to compose one consistent system of philosophy; yet in the appearance of that system upon paper, the several parts are loose and disjointed, requiring to be perused with care, perhaps repeatedly, before they will combine into a whole, and act with united evidence
upon

FOR IMPERFECT ARRANGEMENT. 69

upon the mind of a rational and impartial enquirer,

But if the author's ideas are really as well founded as he flatters himself they are, men of competent knowledge will, he trusts, feel the force of truth even through the obscurity of an imperfect arrangement; should he, on the other hand, be mistaken in a considerable part of his doctrine, no real advantage could have been gained, either to himself or his readers, by covering mistake and fiction with the imposing garb of apparent consistence and uniformity.

CHAP.

C H A P. - XIV.

On Impulse.

WHEN one body in motion touches another, and communicates to it the whole, or any part of its motion, the process is called impulse.

It is by impulse that one billiard-ball hitting another, drives it to any part of the table.

As we have seen that the particles of all bodies are composed of condensed *Calorique*, and their interstices filled up with the same substance in a state of greater rarefaction ; it is evident that one consequence

quence of bringing any one body into close contact with another, must be to change the distribution of their *Calorique*.

And as we have farther seen, that any particle of one body has a greater attraction for the particles of any other body, than for its own, and that this superior attraction is probably owing to a greater difference in their respective quantities of *Calorique*, in the one case than in the other; we are led to conclude, that a body in motion has the equilibrium of its *Calorique* deranged, so as to be accumulated in each particle, and in the whole body in the direction of the motion.

a, b, c, d, Fig. 2, represents a body with its particles and interstitial *Calorique*

F

in

in a state of rest. A, B, C, D, is the same body moving towards E.

If the unity of a solid body (as glass) is not strongly cemented, the impulse of another, instead of creating motion in the whole, destroys the unity, and separates the parts.

CHAP.

C H A P. XV.

On Acoustics.

THIS Chapter will contain the explanation of one solitary fact in the science of Acoustics, selected (perhaps too hastily) from an entire theory of sounds, in which the author has been obliged, by his love for philosophical truth, to depart in some few instances from the opinions generally received upon that subject, and in many others, to go beyond them. The former step he has always taken with reluctance, and the latter with caution, well knowing, that although the consent of numbers, considering how

F 2

that

that consent takes place, no more proves the truth of any position, than the agreement of the several copies of an edition does the correctness of the text; yet in an enlightened age, where men have the unrestrained use of their faculties, it is difficult for any doctrine to gain ground and obtain universal consent, which was not, at the time when it first made its appearance, supported by all the evidence which the state of human knowledge, as it then stood, would admit.

To the subject of sound, in all its branches, the author has been led by his fondness for music, both practical and theoretical, to pay uncommon attention; and it was there principally, and in the sister-subject of light and colours, that he first met with those principles, the
pursuit

pursuit of which pointed out to him the connexion between natural and moral philosophy.

After this introduction, I shall state and explain the fact in question.

The rumbling noise which is heard, when the external opening of the ear is closed, seems owing to the motion of the blood, the sound of which is communicated to the organ of hearing by the continuity of parts, not by the intervention of air, the ordinary medium of sound. Two facts agree well with this supposition: the first is, that people whose hearing is much impaired constantly hear a similar rumbling. The other, that if a watch be applied to any other part of the head, as to the angle of the lower jaw, while

the external opening of the ear remains unclosed, the watch is heard in the usual tone, by the intervention of the air, but as soon as the ear is stopped, the tone becomes stronger, and more like to that which the watch has when applied close to the ear.

The theory of this last fact I take to be the following: while the passage of the ear is open, the motion of the blood is not heard, because by habit the organ is become less susceptible of it, and the sound is drowned in that of external objects. Accordingly, when from the effects of drinking, or any other irritation of the head, the motion of the blood is increased, that motion comes to be heard, even while the external opening continues unclosed.

CHAP.

C H A P. XVI.

*On Number, Weight and Measure,
considered philosophically.*

THIS and the following chapter, on Ridicule as the Test of Truth, are in their very nature so detached from the more systematical parts of this work, that they might be placed almost anywhere indiscriminately, and yet as they either throw light upon the whole, or obviate objections which are equally applicable to every part of a new theory, they could not be rejected altogether. I have chosen to place them here, that I may not be in-

interrupted in the more important disquisitions which are to follow, on subjects more immediately connected with moral philosophy.

In applying the powers of nature to our own purposes, we have different methods of determining quantities of power for immediate use. We either ascertain the quantity of power by direct experiment, at the time of putting it to use; or having previously divided it into portions, of which we know, or think we know the quantity without experiment, we find the whole power, by determining the number of such portions.

This idea may be illustrated by the use of money. Supposing it to be previously determined what quantity of any
metal

metal shall represent a given quantity of human labour, there are two ways of dealing out the quantity of the same metal, necessary to purchase any other quantity of labour. We may either weigh or measure off a proportionate quantity, as seems to have been the custom in the infancy of society; or having previously weighed or measured off small and equal quantities, and put a mark upon them, to distinguish them from others, count off as many of these portions as will make up the quantity desired. This is in fact the way in which we purchase at present.

Many operations of human industry are directly copied from nature. The process of forming such artificial units, in order to substitute the simple process of tale for the more complex one
of

of measurement, is a transcript of the proceeding of nature, in forming such natural units, as we have formerly had occasion to consider. Guineas, shillings, pence, &c. are artificial units; men, horses, pease, beans, chrystals, plants, suns, systems of suns, are natural units.

But there is a circumstance relative to nature's unit, by which we are often led into an error. Man, one of nature's units, and that which naturally interests us the most, frequently covers very considerable diversity under external marks, scarcely distinguishable. Carelessly inspecting those marks, we too readily conceive such units to be similar and equal, and are consequently liable to be greatly deceived in our expectation.

The

The real truth is, the propensity in mankind to diverge from each other is so very great, that it requires uncommon art to give any great number of men the same, or nearly the same stamp. A regiment of well exercised foldiers comes nearer to such an equality than any thing else, and we well know what pains must be taken before such a regiment can be formed.

C H A P. XVII.

On Ridicule, as the Test of Truth.

WE are told by Horace, that pleasantry will sometimes effect, what grave reasoning may have attempted in vain. Accordingly, in every kind of controversy, whether oral or scriptural, recourse is had, by those who either distrust their cause or their abilities, to the forcible weapons of ridicule. Ridicule, however, is in fact no test at all of truth : no new discovery was ever promulged by its means. Where the multitude is in the right, it may silence the ill-founded attacks of ignorant

norant or interested opponents ; but as its whole strength consists in an appeal to the preconceived opinions of the majority, if they happen to be wrong, (which they certainly may be) it can do no more than lend a temporary aid to the delusions of prejudice.

Let C be Copernicus. A, B, D, E, F, &c. cotemporary men of learning, devout believers in the ancient doctrine, that the earth is fixed in the centre of the solar system, and that the sun revolves round it.

A, B, C, D, E, F, &c. meet in company, and the conversation turns upon astronomy ; during which C is at first reserved, and seems to fall in with the generally received opinion, till the compliments

pliments paid him upon the justness and beauty of some of his notions having opened his heart, he ventures to express a doubt, whether the sun really moves round the earth.

A. Surely, Mr. C, you could not be serious in what you advanced just now.

C. Indeed, Mr. A, it may seem strange to you, but I have my reasons for doubting, whether the commonly received opinion upon that subject be true.

A now puts on a countenance of triumph, looking alternately at C and the rest of the company, whose faces are all the time distorted with a half-grin. Poor C seems struggling in vain to compose his agitated mind.

A. Well,

A. Well, but, good Mr. C. if the commonly received opinion be erroneous, what are we to believe true?

C. [*In evident confusion.*] Why, Sir, since you oblige me to speak out, I think the earth moves round the sun.

A and the rest of the company, after an interchange of expressive looks, fall upon some other topic of discourse. C continues dejected and absent.

While the ordinary subjects of conversation are under discussion, A suddenly starts up, as if in a fright, lays hold of the back of D's chair, and, being the avowed wit of the company, immediately attracts the attention of all the rest.

D. What's

D. What's the matter, Mr. A.

A. Why truly, C's opinion had taken such hold of my mind, that in a reverie, I began to fancy you might be thrown from your seat in the rapidity of your career round the sun, [*setting up a horse-laugh.*]

B, D, E, F, &c. join heartily in the laugh.

C grows still graver and more perplexed.

D. Nay, Mr. A, now you are too severe. Ha! ha! ha!

Ergo, the earth does *not* move round the sun. Q. E. D.

S E C T. II.

On Animated Nature.

T H R O U G H O U T the whole of this attempt to point out the connexion between natural and moral philosophy, I have considered the latter as forming the principal, as it is certainly the most interesting part of my subject.

I have now gone through those parts of natural philosophy, upon which I conceive that my speculations have enabled me to throw new light, and if my haste to enter upon the more important parts of my work has obliged me to leave

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several

several subjects quite untouched, and to treat others rather more superficially than I could have wished, I still flatter myself that I have drawn such an outline of those branches of natural knowledge, which border upon the knowledge of man, as shall enable the attentive reader to comprehend what I shall have to offer on the subject of those laws, by which the feelings and actions of our own species are guided, and to perceive the full force of the application I shall make of the new principles I have laid down, to the most important event which has ever occurred in the annals of mankind; I mean the origin of Christianity.

CHAP. I.

On Life and Sense in general.

LIFE and sense depend upon a certain portion of *Calorique* diffused through the whole organization of an animal.

If I say, that perception is one of the properties of *Calorique*, and motion the natural effect of perception, and that wherever in any system the *Calorique* of every part is connected by continuity with a portion of the same substance placed somewhere as in a centre, that centre will have a perception of all the changes

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which take place in the system, and will have a power of producing motion in every part of the same system; when I say this, the negative can never be proved till you produce me a system so formed, where the effects do *not* ensue.

When this superinduced quantity of *Calorique* is removed (which before by its presence shielded the *Calorique* existing in the body as a mixt from external influences, by receiving those influences, and thereby producing the phenomena of life) then the *Calorique* contained in the mixt comes to be affected by external influence, and that mixt of course to be changed.

Without life, the body may be preserved from putrefaction, by keeping off in
other

other ways those powers, which, by their influence, produce that change; as, water by drying; air by subterraneous interment; or in general, by covering the whole with a dry varnish, as in anatomical preparations, embalming, &c.

I assert, that in the common phænomenon of elasticity, where one body, being impelled against another, is thrown off with a certain degree of force, there is every thing which takes place in a sentient being, when he acts from external causes, except consciousness of perception; and that never can exist, unless the observer is at the same time the subject of the experiment. When I see another man act from external inducement; that he perceives, resolves, and then acts, is only conclusion from what I

know to take place in myself, reasoning upon the following general principle.—

When in a series of causes and effects, several links are proved to be the same in one case as in another, any intermediate link, not clearly seen in one case, must be concluded to exist in that case, as well as in the other.—Now, that man has had an inducement applied to him, and I have seen him act as I should have done, had the same inducement been applied to me: whenever that has happened, I have been conscious of perceiving, resolving, &c. therefore that man perceived, resolved, &c. too.

In an inanimate body I perceive no such resemblance, and am therefore not inclined to suppose an intervening perception. That notwithstanding some
small

small degree of it does take place, I think highly probable. But let me be rightly understood. Suppose one billiard-ball to be impelled against another, and to be thrown back. Fig. 3, A being fixed, B is thrown against it; it recoils. I cannot say A perceives the stroke. B hits in fact only a small portion of A, displacing its particles, and compressing its interstitial *Calorique*; that small portion of *Calorique* probably perceives the stroke, or, if it be diffused over the whole ball, then many little parts of A perceive it separately, faintly, and differently; but in no case can A as a whole be said to perceive it. Before that can take place, a peculiar organization becomes necessary.

Words and things will never exactly agree, till languages have been formed

upon a perfect acquaintance with every part of nature. Here, therefore, as in other parts of science, the line of distinction is not drawn in things, as it is in our words, the *Calorique* of life being in reality continuous with the *Calorique* of composition. Therefore, if death takes place by a gradual consumption of the *Calorique* of life, that of composition becomes exposed, and putrefaction directly ensues: if by mechanical violence, *i. e.* by separating some large portion of the whole, necessary in the processes of life; much of the *Calorique* of life remains after death, and putrefaction follows more slowly.*

* It is this circumstance which constitutes the difference between carrion and butcher's meat.

During

During life, the expenditure of the *Calorique* of life is replaced by aliment and the influence of the air. Expenditure is the consequence of action. Where there is no action, the body may subsist without expenditure. The chameleon exists in a torpid state without sensible food, or sensible evacuations for months together; and in some well-known instances women and enthusiasts have lived upon tea or orange-juice alone for a considerable time.

The fresh vigour felt by a famished person immediately upon taking food, is owing to the first increment of *Calorique* being instantaneously diffused over the whole body.

Water and salts are formed in animal bodies, as elsewhere, by the union of airs,
deprived

deprived of that *Calorique* which is essential to their aëriform state. Hence we see the origin of those salts which are found in the atmosphere, in the sea, and in the excretions of an animal body, as in the serum, urine, tears and perspiration.

By this theory the difficulty of accounting for the operation of the soul upon the body, and the body upon the soul, is entirely removed. All bodies contain the same substance, with that which constitutes the most active part of animal bodies, and of the human body in particular, differing only in proportion and arrangement.

CHAP. II.

Of the Laws of Motion, applied to organic and sentient Bodies.

WE have seen, that when any body is in motion, whether from impulse, or from any other cause, the *Calorique* of the whole mass is thrown out of its equilibrium, and that the motion may be considered as an attempt to recover that equilibrium.

In the case of bodies not possessing a sentient centre, the motion is attended with no other striking consequence. But

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as in sentient bodies, the *Calorique* serves other very important purposes, in their internal œconomy ; for this reason changes in the œconomy of such bodies must take place from the motion of the entire bodies, and must be perceived by the sentient principle.

Accordingly, we find that all these circumstances happen, as might be expected. And first, in an healthy human body, a certain degree of uneven motion, by mixing more perfectly the different ingredients of the whole frame, and destroying all accidental inequalities of distribution in the *Calorique* of life, diffuses a pleasing alacrity over the whole man, which, in one accustomed to the exercise of his intellectual faculties, has a very sensible effect in enlivening their play.

play. Dr. Johnson declares, that human life has not many things beyond a ride upon a turnpike-road in an English post-chaise. In which judgment he is by no means singular. And Pliny assures us, that it is wonderful how the mind is invigorated by bodily exercise *. In the passage to which I allude, he seems indeed to speak of walking; in which the good effect is heightened by the concurrence of other causes, as fresh air and muscular action, and diminished (unless in very stout habits) by the exertion necessary in walking. But still part of the effect is due to exercise, as motion.

* Mirum est, ut animus agitatione, motuque corporis excitetur.

Plin. Epist. Lib. i. 6.

When

When a person is in the act of swinging, there is a peculiar indescribable sensation, while he is descending from the greatest height, which ceases when he is at the highest points of the arc, and seems to depend on the manner in which the motion of swinging disposes of the *Calorique* contained in the human system. For the sensation itself, I must appeal to the reader's recollection, if he has ever tried the experiment, and to the experiment itself, if he has not; warning him, however, that he must expect to feel the effect less distinctly, in proportion to the strength and vigour of his constitution.

Coach and sea-sickness are explicable upon the same principles. Both affect weakly and irritable constitutions more
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than others; because, on the first account, any portion of *Calorique* abstracted from one place, is more wanted, and on the second account, because the whole is more moveable. But farther, since in common walking, men generally move forwards, the system therefore acquires a habit of accommodating itself to the distribution of *Calorique*, consequent upon motion in that direction: hence those who grow sick in a coach suffer most when they ride backward. After riding for some time, the most weakly habits accommodate themselves to the new distribution, while it continues unchanged, but suffer more or less, as often as it undergoes any alteration. They feel a squeamishness upon first setting out, and upon stopping suddenly.

There

There is a fact mentioned by Dr. Darwin, of Derby, in the first volume of his *Zoonomia*, upon the authority of a Mr. Brindley, of men falling asleep, while stretched across a mill-stone in motion, which admits of a ready explanation, by means of my theory *. The whirling motion produces an accumulation of *Calorique* at both ends of the body. But on account of the superior hardness, and the consequent less mobility of the *Calorique* contained in the skull, the centrifugal endeavour will be stopped between the dura and pia mater, and the *Calorique*

* I have had this fact confirmed to me in conversation, and been farther informed, that the same principle has been applied to the purposes of medicine. A lady was lulled to sleep by a whirling machine, who had not enjoyed that benefit for years.

will

will accumulate through the whole circumference of the encephalon. But it has been shewn, under the proper head, that any compression of the encephalon is productive of sleep.

C H A P. III.

On Sleep.

ONE of the most extraordinary phænomena exhibited by living animals is that of sleep.

In explaining this phænomenon, I shall almost entirely confine myself to the consideration of it, as it occurs in the human species, by which means I shall gain the advantage of being able to appeal to the experience of every reader, for most of the facts upon which my theory will be constructed.

During

During sleep, sense, consciousness, and voluntary motion are in a great measure suspended, either from fatigue, or for want of the proper inducements to exertion.

Fatigue does itself produce a difficulty and sluggishness both of perception and voluntary action; and a similar difficulty and sluggishness are likewise the effect of withdrawing many of the usual inducements to action; but this difficulty and sluggishness differ widely from the total cessation of all voluntary motion and perception, which characterise the state of sleep, when perfectly formed. Let us then examine into the proximate cause of the sluggishness which precedes sleep, and then into the difference between that and the proximate cause of sleep.

The brain is the principal agent, both in perception and voluntary motion. Its activity depends upon a fund of *Calorique* contained in its composition, which in every action it performs is exhausted, or discharged, under the form of sensible heat, steam or otherwise, until being reduced to a certain quantity, the ordinary inducements are no longer sufficient to call it into play. This is the sluggishness of fatigue. But although the active fund of the brain continue undiminished, yet if the ordinary inducements be removed to a certain extent, action, which depends both upon the fund and upon the inducements applied to it, becomes impaired, and the sluggishness of indolence is brought on. Either of these states are preparatory to that of sleep: but in what does sleep itself consist?

Before

Before I can answer this question, I must call the attention of the reader to the anatomy and physiology of the brain.

There is a space intercepted between what anatomists call the dura and pia mater, which in a living healthy subject is filled with a subtle elastic fluid, exuding partly like other secretions from the blood-vessels of the two surrounding skins, and partly formed of bases derived from another source. We may represent the brain as a kind of solid island floating in the elastic fluid above-mentioned, by which it is every where surrounded. The base of the brain then, or that part which looks towards the neck, rests as it were upon a stratum of this elastic fluid. Through this stratum pass all the nerves of the body, by the in-

tervention of which the commerce between the brain and other parts of the body is carried on. When these nerves are excited, *i. e.* both vigorous and stimulated, the surrounding elastic fluid yields and leaves the nerves pervious.

But when either the sluggishness of indolence, or that of fatigue, takes place, the nerves being exhausted, or not stimulated, give less resistance to the surrounding fluid, which of course compresses the nerves, and renders them impervious. This is the state of sleep, which continues until either some violent stimulus being applied to the nerves, or their own elastic contents accumulating by degrees during sleep, the passage is again forced open, and the waking state restored.

It

It would be a great confirmation, as well as illustration of my ideas respecting the proximate cause of sleep, if I should here apply it to some of the anomalous cases of that curious state, such as watchfulness from excessive fatigue, somnambulism, catalepsy, &c. But so many other subjects press upon my notice, that I must reserve the full elucidation of those particulars for some future occasion; and for the present pass on to the next section.

SECT. III.

On Man.

THE proper study of mankind is man.
And as the most universal object of human pursuit is happiness, my first chapter will discuss the physical nature of that interesting something,

For which we bear to live, or dare to die.

CHAP.

(III)

CHAP. I.

On Happiness.

THE physical cause of happiness, or pleasure, is such an expenditure of the finer secretions, or what are commonly called the animal spirits, as shall just equal the proportion in which they are secreted.

While the condition just mentioned continues to be observed, the more rapid is the expenditure, the more happiness will any individual enjoy.

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The expenditure of animal spirits must likewise be entire, *i. e.* the matter and *Calorique* which enters into their composition must be equally expended ; and it must be equable, *i. e.* over the whole frame each part must contribute neither more nor less than its proper portion.

These conditions will be farther illustrated in their proper places.

Hence neither can excessive labour be satisfactory, nor is there any pleasure in continual idleness.

In the upper ranks of life unhappiness depends much more commonly upon defective than upon excessive action. But as action is never entered upon without motives, and necessity, which is the principal

cial and most powerful motive to action, is in the very nature of things totally excluded from the upper ranks, whatever facilitates action, whatever furnishes a series of easy actions, or such as require but slight inducements, will be found in the higher stations of life to promote happiness.

The excitement of ideas, which is one species of easy action, is greatly assisted by their being associated. In consequence of association, one impulse excites a whole train. Accordingly, we find that retracing old associations of ideas is a common mode of promoting happiness. For instance, satyrical writers, who wish to be read by those whom their writings are intended to reform, are under the necessity of giving striking descriptions of

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the vices they condemn, that by means of the *pleasure* which the profligate find in retracing the steps of their former debaucheries, they may be cheated, as it were, into an attention to the moral instructions of the satyrist. But unfortunately while they endeavour (by this proceeding) to reclaim the vicious, they too often contaminate the minds of the innocent.

By this theory of happiness we may explain the attachment which most men feel to their native country. It was there they received their first ideas; it was there they formed their first associations; it is there they find the keys to all their intellectual treasures. That the explanation now given of the *amor patriæ* is well founded, is confirmed by a very remarkable

markable circumstance, that it is scarce to be met with in the first periods of society. Without cities, and often without fixed habitations, men at that period are little attached to their native soil. Their roving manner of life admits not of their collecting in any one place a sufficient number of ideas, for it to possess exclusively the property of bringing the powers of their mind into play.

To the same circumstance we owe all that is refined and elegant both in love and friendship. With the sight of our friend are associated all those trains of ideas which have been the usual topics of our conversation.

Nearly of the same nature is the pleasure derived from reading. Those who
read

read for use indeed, or to acquire their first ideas upon any subject, wish to be informed with minuteness of every particular relating to it. But that is not the kind of reading to which I now refer. Such as read for amusement only, chuse subjects with which they have already some acquaintance, and are best pleased with hints, that serve only to excite their own ideas, and call up to view the associations already formed in their minds.

In the same way we may account for the following phænomenon. To gain the good-will of an elderly man, whose mind is not vacant, you need only inform yourself with what subjects he is most familiar, and so by introducing them in conversation, enable him to re-
trace

trace such associations as he had previously been in the habit of forming.

The instinctive fondness of parent-animals for their offspring is another instance of the pleasure derived from exciting old ideas, and retracing former associations. The animal which is the object of the parent's love has, during the whole time of pregnancy, been acting upon the brain of the parent through the intervention of the nerves, like any other external object. After birth therefore, as its helplessness prevents it from being in any respect an object of rivalry, it must necessarily, by constantly exciting the ancient cerebral traces, produce an high degree of pleasure in the mother; and these traces the constantly recurring wants of the young prevent from being soon effaced.

faced. As it grows up, distance and new objects produce a new set of ideas and associations in the young one, and the attachment gradually subsides. For it is to be observed, that as the fondness of the parent arises from its action upon the parent, so the reaction of the parent produces the instincts of the young, which are therefore exactly fitted to each other.

C H A P. II.

*On the Difference between Man and other
Animals.*

ALTHOUGH I shall frequently have occasion to hint, that the superiority of the human race to other animals is not so immense, as ignorance, pride and prejudice are apt to represent it, yet it is great enough, even when seen by the pure light of reason, unmagnified by the mists of dullness, to deserve the closest attention. I shall proceed to enquire upon what that superiority depends.

Comparative anatomy teaches us, that the principal difference between a *dead* man and a *dead* animal of any other resembling species, consists in the greater proportion which the human brain bears to the other parts of the body.

Comparative physiology shews, that the chief difference between a *living* man and a *living* animal of any other resembling species, consists in the tendency of the former to unite with other individuals of his own species into a body politic, and the far greater range of circumstances to which he can accommodate himself.

Just philosophy will teach us, in the phenomenon exhibited by anatomy, to
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search for the cause of the appearances pointed out by physiology. But before this can be done, we must endeavour to throw a few rays of light upon physiology itself.

All animals that bear any resemblance to man have a power, by means of a process, to be described in another place, of converting food and air into a fluid called blood, which is contained in a two-fold set of vessels, called arteries and veins, so as to be sent by means of the heart through the former into the latter, and from them back to the heart. This process is called circulation, and will be illustrated by Fig. 4.

In the course of circulation, the blood is considerably changed, especially in co-

lour and stimulating power, the liveliness of the one and the degree of the other being much lessened when it arrives at the heart, after having gone through the body. But by means of a second circulation through the lungs, which need not now be considered, the former process is inverted, and the blood comes back to the heart, to be again sent into the arteries, with its colour and other powers restored.

This loss of colour and stimulating power is what I am now to consider. In order to this, it is necessary to remember, that an animal body consists not of blood-vessels alone, but of much other matter, all of which, however, may be comprised under the general title of cellular structure. Fig. 5. will help to clear up

up the idea. Into this cellular structure the air and other substances are received from the atmosphere by a process called inhalation *, which I shall describe elsewhere. There is an uninterrupted connexion between the cellular structure all over the body. While the blood is circulating, it parts with much of its vitality, or *Calorique*, to the bases contained in the cellular structure, by a process called secretion; and this it is which makes it come back to the heart deprived of its energetic properties as explained above.

The whole of an animal body may then be divided into two parts, the mass of blood, and the secretions, with their respective containing parts. The secre-

* See Abernethy's Essays.

tions are wasted, so as to require renewal, chiefly by the operations of sense and animal motion. The nature of those processes, how they convert combined *Calorique* partly into sensible heat or disengaged *Calorique*, and partly by its union with the unvitalized bases, into salts, steam, warm water with salts in solution, &c. must be explained in another place. To return: of sense the brain is the seat, and all motions directed by sense originate in the brain.

The effect of the heart in propelling the blood will be as its own force directly, and as the resistance opposed to its action inversely. The action of the heart is principally exerted upon the trunks of the blood-vessels; in the minute arteries, and especially where they pass
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over into veins, another power, which I am going to name, is a principal cause of motion. The cause to which I allude, is the expenditure and renewal of secretion. For as it is by that process that the blood loses its *Calorique*, it is clear that the discharge of *Calorique* by secretion and of the unvitalized parts of the blood by the liver, must, by unloading the minute arteries, very much diminish the resistance which the heart meets with in its action. Besides that any secretion being by whatever cause alternately increased and expended, the blood is attracted to the part, to supply the deficiency, so that increased secretion is in that way too a cause of increased circulation, and the reverse. Of this I shall give instances in their proper places.

Those fluids which are the predisposing cause of sense and animal motion, are produced like others by secretion, not however, as is generally supposed, in the brain, as a secretory organ, but in every part of the body where there are nerves and muscular fibres *. The brain is no more than the organ of reference, with respect to sensation, and with respect to motion, the place where that species called voluntary originates,

Voluntary motions, strictly so called, from which are excluded passionate and convulsive actions, take place after sensation, by the intervention of ideas, which are such changes in the medullary fibres of the brain, as dispose them to fall into

* See Monro, on the Nervous System,

some one particular mode of action only ; and this action is probably of the vibratory kind.

Every operation of the brain, whether it be sensation, revival of ideas, or origin of voluntary motion, is attended with expenditure of *Calorique*. Perhaps the difference between action upon the secretion of other parts, and the action of external causes upon the brain, consists in this, that in the brain, as there is no outlet for the superfluous matter*, every such action, that is, every sensation leaves a permanent change in the brain, which is the foundation of memory.

* I ought long ago to have apprized the reader, that where I use the term *matter*, I mean by it, the sum of the particles of any substance, in contra-distinction to its interstitial *Calorique*.

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The variety of voluntary motions in any given animal, depends upon the variety of its ideas, and that again upon the room afforded by the sensorium, or in other words, upon the comparative size of the brain.

In man, therefore, there will be a far greater variety in the operations of the brain, than in other animals. But as voluntary motions are adaptations of motions to ideas, and ideas are copies of things without the animal; that animal will adapt itself to the greatest variety of situations, which has the greatest variety of ideas. But this we have shewn to be the case with man. Man therefore, of all animals, can adapt himself to the greatest variety of situations. Which was one thing to be explained.

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The other thing, I mean the tendency to unite into bodies politic, flows from the one just explained in conjunction with another. The union of many individuals into one body politic, is the result of the faculty which every individual has of profiting by other individuals, or adapting its own views to those of others. The other circumstance, which in conjunction with the superior size of the human brain predisposes man to unite with his fellow-men into communities, is his sensibility. But of that I may have occasion to treat hereafter.

CHAP. III.

On Language.

ONE of the principal marks, by which men are distinguished from other animals, consists in the former possessing a method of communicating their sentiments to each other, more or less perfectly, by means of language.

It is now universally agreed, that this prerogative does not depend upon a greater flexibility in the organs of speech only, since that flexibility is possessed by some other animals, in a degree that enables

enables them to articulate human languages with tolerable distinctness; but upon a power, peculiar to man, of associating certain sentiments with certain words, according to fixed rules, so that by exciting the idea of one, you may always excite that of the other, in any individual using the same language.

In fact, language is one of the advantages derived by man from the superior size of his brain to that of other animals, being a branch of that power of accommodating himself to different situations, which I have formerly deduced from the above-mentioned structure.

But as language would be useless to a solitary individual, so it could never have been invented, had not man been a social
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ble animal. Language is entirely the creature of society ; it is produced by the same cause that produced society itself ; and influenced by all the changes to which it is liable. Formerly almost all Europe formed one great empire, each province of which, besides its original language, spoke that of the Romans, by whom they had been subdued. When upon the decline of the Roman empire, its provinces became independent states, they by degrees acquired independent languages, in which however the Latin appears, nearly in proportion to the degree of subjugation to which the inhabitants of each country were reduced, and to the time, during which they continued subject to the Roman dominion. The English, French, Spanish, and Italian languages, are to this day dialects of the Latin ; the
German,

German, Danish, and Swedish languages have very few words of Roman extraction*. The Greek affords indeed an exception, of which however the cause is very obvious. The degree of civilization, at which the Greeks had arrived before they submitted to the dominion of the Romans; the veneration in which the Greek tongue was held by the Romans under the first periods of the em-

* It is somewhat remarkable, that the German word, signifying *window*, is clearly derived from the Latin. Perhaps the Germans first learned from the Romans, to make a distinction between windows and chimneys. In some Westphalian villages, that distinction is still a luxury, in which the common people do not indulge every day. The German word signifying *to write*, is clearly, and that signifying *to read*, somewhat more obscurely of Roman origin: a circumstance upon which I need make no comment.

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pire; the transfer of the seat of government to Constantinople, and the subsequent division of the empire into two independent portions;—all these circumstances prevented the Greek language from undergoing changes similar to those which happened to the languages of the barbarian nations, conquered and civilized by the Romans.

Philosophers have disputed about the mode, in which languages were first invented. As we in no part of the world find any tribes, clearly of our own species, without the use of some language, we may conclude that to form languages is one of our natural instincts, but as it is one of those, which we acquire after birth, it must partake of that diversity which results from the diversity of circumstances,

cumstances, to which men after birth are exposed. Languages arise gradually from those circumstances, undergoing progressive improvements, first in families, next in small tribes, and at last in extensive communities.

All languages consist of roots, and of analogical flexions; but in different languages, the proportion which the roots bear to the total number of words, is extremely different. Considered as systems of words, and as vehicles of pleasure, those languages are the best, which contain the fewest roots; such languages will be found best fitted for the purposes of poetry and declamation. In this respect our modern languages will bear no competition with those of the ancients. But for the uses of philosophy, and for

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the purpose of conveying to each other our real sentiments with accuracy and fidelity, the want of extensive analogies in our modern languages is rather to be considered as an advantage. Similar flexions do indeed tend much to facilitate the acquisition of a language; but at the same time, it is difficult for the speculative philosopher, in his enquiries after truth, to avoid being led astray by them.

Of the analogies to be found in the flexions of language, much may be the effect of improvements made in them by learned grammarians; such we know to have been lately introduced into the English language by the celebrated Dr. Johnson*; but much must be attributed to

* For his acknowledgment of the fact, see the last paper in the Rambler.

an original tendency, which they derive from the structure of the human mind. That tendency will be referred in another place to a general law of nature, which I shall lay down here, reserving the proof till I come to consider the law itself. Generation, beginning from different points, not lying within each other's sphere of action, will always form analogical resemblances, more or fewer, according to the less or greater interference of collateral powers, all generation depending principally upon the expansion of a point into a sphere.

Among other proofs that many of the analogies, which grammarians discover in languages that have already attained to some degree of perfection, result blindly from the structure of the human

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mind,

mind, we may mention, that where custom has, among the higher orders of mankind, established flexions of words not according to the usual analogy, the vulgar are still apt to adhere to the latter, as might be shewn in numberless instances *.

After society has arrived at an high pitch of refinement, one use which is frequently made of language, is to conceal a man's real sentiments ; and this stratagem is carried so far, that it requires considerable knowledge of human nature, or practice in the world, not to be the dupe of it.

* For instance : they make *frit* of fright, according to *bit* from *bite*, following the sound ; *seed* from *see*, according to the usual flexion of the preterite ; custom having established *saw* irregularly : so *lit* from light, &c.

CHAP.

CHAP. IV.

On Sense in general.

OF the term sense, there is no occasion to attempt a definition ; and indeed to do so would be equally unnecessary and impossible. As the idea is itself perfectly simple, it is incapable of being resolved into any others ; and the best way to come to an agreement respecting the signification of the word, is by an appeal to the consciousness of every human being.

Circumlocutory descriptions of sense have been given, but they are of little

use. I am inclined to doubt, whether any one will find his stock of knowledge much increased, by being informed, that sensation is a change in the state of the mind, depending upon a change in the condition of the body.

In every sensation there are two things to be carefully distinguished; the change produced in the mind itself, and the properties of external objects, which are the causes of that change. In general the danger of confounding these two is not very great; but as in some instances, especially those of light and heat, they have really been confounded, it is worth a philosopher's while, to pay some attention to the best mode of distinguishing them.

Sensations

Sensations are divided into those of impulse and of consciousness ; the former are produced by causes existing without the sentient being ; while the latter have their source within him.

In order to produce sensation, it is necessary for the cause to act with a certain degree of force, and for a certain length of time. Very weak impressions, though acting almost constantly, are without effect, and the strongest impulses, if only momentary, are scarcely perceived.

For any impulse upon the organs of sense to be effectual, it is further requisite, that it be seconded by attention of mind. This is so powerful, that by directing our attention particularly to a

number of impulses made upon our senses at the same time, we can choose one or more which we will perceive, and voluntarily disregard all the rest. Nay, we can acquire complete information from an impulse of the weakest kind, while one of an hundred times the force makes no impression at all. Thus at a concert, a man shall select one instrument among twenty or thirty that are sounding, and attend so entirely to that one, as to be utterly unconscious of the sounds produced by the rest. Two friends shall converse together in a whisper, while a large clock is striking in the same room; neither of them shall lose one syllable of the conversation, and at the end of it both be ignorant, whether the clock have been striking or not.

Sensation

Sensation continues for some little time after the external object which occasioned it has ceased to act. It is owing to this circumstance, that a shining body whirled round with a very rapid motion, gives us the idea of one continued circle of light. On account of the extreme rapidity with which the body revolves, the sensation occasioned by its action, in every point of the circle, still continues, when the body returns to the same point, after having made a complete revolution.

Hence likewise the sensation we receive from a sounding body is that of a continued sound, though it is well known that the action of the elastic body, by which it is occasioned, is that of an alternate vibration. Of the truth of this we have the completest proof in the sound
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of a bell. This sound appears perfectly continuous at first, while it is possessed of sufficient strength to give a long-continued sensation; but dying away by degrees, it at length becomes too faint to keep up the sensation during the space of an entire pulse, and then the vibrations are heard distinctly.

The nature and strength of sensations depend upon three circumstances; the original constitution, in which I conclude the present state of the whole frame, as well as that of particular organs; the force of the external impulse given to the senses, and lastly the attention of the mind employed upon the subject. Hence if we suppose the constitution to be given, a sensation of a determined force may be produced by an infinite number of different

rent proportions between the external agent, and the attention of the mind; and as on the one hand, a strong perception may take place with little or no attention of mind, provided the impression from without be very powerful; so on the other, an equal perception may arise without any external impulse, by an uncommon exertion of mental attention. And it is upon this last circumstance that the surprising faculty of memory is founded.

C H A P. V.

On Common Sense.

COMMON sense is that faculty of thinking and acting, which enables a man to promote his own welfare, and that of all those with whom he may be concerned, without interfering with the duties he owes to the rest of society. It consists chiefly in being content to accommodate his views to those circumstances, of which the direction is not in his power, and never indulging the vain wish, to make every thing correspond with the flattering prospects which are presented to him by his own imagination.

CHAP.

C H A P. VI.

On Apparitions.

I N the chapter on human sense in general I have distinguished between the occasional, predisposing, and proximate causes of sense. We have there seen that the same degree of sensation may arise from a predisposition varying greatly in magnitude, provided the want or superabundance of that cause be compensated by a proportionate superabundance or want respectively in the occasional cause.

In the last chapter I have defined common sense by its effects, and may here
add,

add, that it depends upon such an equal balance between the predisposing and occasional causes of sensation, as shall prevent either from preponderating. For if we look abroad into human life, and select instances among our acquaintance, of such as are remarkable for soundness of intellect, or what is generally called good sense, we shall find them to be men who contrive to preserve their organs in a state neither of exhaustion, nor of superabundance, and who are besides placed in such a situation, that they have a constant and almost regular call upon them for the employment of their faculties, or to speak philosophically, a regular application of occasional causes.

But these advantages numbers of our fellow-creatures are deprived of. Many
are

are born with organs faulty either through excess or defect, and many more find themselves placed in such awkward situations, that though blessed with the soundest organs, they have not that constantly recurring and measured call for their use, by which they might be enabled "to bring forth fruit with patience," and at the same time to preserve their frames in the proper state of equilibrium. They are at one time fatigued with excessive exertion, and at another wearied with involuntary idleness. Some through poverty are always under-fed and incapable of labour, others are always over-fed, because ignorance and want of inducements to employ themselves, leave them no other way of wasting their wealth, but that of alternate eating, drinking, sleeping, and amusement.

It

It is not my intention to enlarge at present upon the many whimsical actions and diseased wishes which are occasioned by these untoward circumstances. I shall only touch upon two extremes which are apt to be the effect of two contrary misfortunes. The two extremes to which I allude, are on the one hand a tendency to what is called absence of mind, and on the other, a disposition to have sensations, which are not connected with the usual occasional causes, and which therefore make men's judgments, respecting external things, differ from those which are dictated by common sense, and which the average-conclusions of mankind oblige us to conceive founded in the nature of things.

There are men who seem to be naturally defective in point of sensibility. In
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the same circumstances they are less stimulated than their fellow-creatures. In the interested contest of business, or the more friendly but not less animated one of conversation, where all are exerting themselves to the utmost, such men are necessarily left behind. The tide of business is too strong for them to cope with; the stream of conversation is too rapid for them to keep pace with; and the one scene as well as the other presents to their relaxed minds a constellation of circumstances too vast to be comprehended distinctly at one glance; they act from confused views, and of course act wrong; they converse without any clear ideas of what they are about to advance, and necessarily expose themselves. Such is the case of absent men.

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On the other hand there are men whose organs are so exquisitely sensible, that they always perceive more than other people. A slight occasional cause, which the absent man may perhaps entirely overlook, and in which the man of common sense sees nothing but plain uninteresting matter of fact, shall supply the man of sensibility with a theme, upon which to run divisions and execute variations for half a day. He possesses the talent of amplification in the most eminent degree; but all his thoughts are diffuse comments upon his subject, in which he reasons about it and about it, but never seizes one clear well-defined idea. In business he must be unsuccessful, except as far as acquiring the support of similar characters may be called success. When addressing himself to men who are guided entirely

by their feelings, he may be admired and perhaps followed. A persuasive orator, he may entertain and soothe you ; but an ill-judging steward he will probably ruin you. Admit him without reserve as the companion of your convivial hours, but entrust him not with the management of your affairs.

One of the delusions to which this species of character is apt to be subject, is the seeing shapes without any corresponding external object being present at the time. This delusion has given rise to the stories of apparitions, which have been told more or less in all ages, but have always herded principally with ignorance and superstition. In these times it is little necessary to labour in order to prove their non-existence. However, I

have it in my power to bring the matter to a short issue. I can force the abettors of superstition to a dilemma, which shall make it the least evil to allow that the appearance of ghosts is entirely a delusion of imagination. Men, they say, have been seen after their deaths, when their bodies were under ground. *Sensible* men have been ready to make oath that they have seen apparitions. Well, these shapes shall, if you please, be departed spirits, since you will have it so. I can bring living witnesses, very sensible men too, who have themselves seen the appearance of paintings, and other inanimate objects, at a time when those objects were not before them. One or other, therefore, you must allow me, either souls are not confined to men and women, but reside equally in dogs, paintings

ings, buildings, books, &c. and then beware of the consequences;—or it is equally a delusion of imagination, *i. e.* a sensation formed by the action of a very slight occasional cause upon a strong predisposition, whether the spectre put on the form of a man, a horse, a book, or a pitch-fork.

While I am upon the subject of apparitions, it is impossible not to recollect two particular instances of their supposed existence, which are mentioned in histories much too authentic to be disregarded. I mean the appearance of the prophet Samuel to Saul, and that of Cæsar to Brutus; the former mentioned in the second book of Samuel, and the latter by Plutarch in his life of Cæsar.

These two stories will give us no great trouble, if we consider to what kind of character in both the circumstance happened. Saul had been crowned king of Israel, chiefly through the interest of the prophet Samuel, which was still extremely great, though rather on the decline. Upon one occasion, however, the king affronted the prophet past reconciliation, by disregarding his advice; upon which the effects of his displeasure were immediately apparent, and Saul became melancholy and dreadfully jealous. Yet there seems to have existed a friendship between the two, which continued till Samuel's death, and which, on the king's side, bore every mark of the foolish fondness of an inferior character. One instance of this was his pathetic request to Samuel, to turn again, and do him honour

honour in the eyes of the people. And, in my opinion, another instance is the circumstance we are now considering. His inexperience, and the pressure of public affairs, produced the highest degree of uneasiness in the feeble mind of Saul, and made him ardently long for his former adviser. No wonder then that he was easily persuaded to credit the imposture of an artful woman, who pretended to deliver the sentiments of his dead friend from his own lips.

In the case of Brutus, the circumstances, though somewhat different, are not very materially so. The apparition was seen by Brutus himself at two several times; once when sitting in his tent, ruminating upon the state of his affairs, which were then almost desperate; and

again, by appointment, just before his death at Philippi. Let us now recollect, that Cæsar and Brutus had been intimate friends, and the attachment must have been very strong to occasion the tender address of Cæsar at his assassination,

xxxi. cu. tervio. Every consideration of friendship, however, had been superseded in the stoical mind of Brutus by the superior concerns of politics. But such a change is never brought about without a struggle. That there was one in the mind of Brutus appears from those nocturnal alarms, which obliged him to reveal his purpose to his wife Portia. It would seem, his mind ran so much upon the difference between the placid serenity which accompanied his former intimacy with Cæsar, and the alarming state of his present prospects, brought upon him-
self

self by the murder of his friend, that at last the image of Cæsar came to be maniacally present to his imagination, and in an age when the philosophy of human nature was still very imperfect, might easily give rise to the story of the apparition.

Upon the subject of spectres in general, many of the staunchest believers go so far as to allow, that all men are not equally predisposed for seeing them. I am inclined to think, that the delusions of imagination, which give rise to such stories, occur most frequently in men of the description commonly known by the name of men of feeling ; and of course, more frequently in women than men.

CHAP. VII.

On Amusements.

WE have formerly seen, that an healthy human subject contains, partly in the nerves, and partly in the cells of the muscles, what gives the disposition to activity, but that to call that disposition into play, to produce real action, other causes are necessary.

Nature has contrived, by means of the alternation of day and night, that once in the four-and-twenty hours, light, one of the principal occasional causes of action, should

should be entirely withdrawn. In consequence of this, the system falls into a peculiar state, called sleep, an explanation of which has been given in another place.

During sleep, while action is suspended, the causes which supply the disposition to activity are still continuing to operate. Upon the cessation therefore of sleep, that disposition is left considerably increased, after the same manner as a fund increases, which, supported by a stated income, is for some time relieved from the usual expenditure.

If it were possible so to proportion the activity of the system, during the waking state, to the degree of disposition which it can afford, as that the one should just
expend

expend the other within the term of vigilance, life might then be divided between serious action and sleep. Indeed something very nearly approaching to this does actually take place in brutes and savages. Some dogs, when not employed, are almost constantly asleep. Very young, or very high-fed animals are exceptions; from the superabundance of *Calorique* owing to youth and high food, they are so irritable, that the ordinary circumstances by which they are surrounded, are sufficient to produce the activity of play or restlessness. With respect to savages, one savage is in general so much like another, that Tacitus's account of the German will apply, with little variation, to the North American Indian, and more or less to every other uncultivated human being. "When not engaged in war or
" hunting,"

“ hunting,” says that admired writer,
 “ the Germans divide their time between
 “ eating and sleeping. The most active
 “ warrior is then completely idle, exhi-
 “ biting at different times the most
 “ striking contrast of indolence and rest-
 “ lessness *.”

But in civilized nations, many circum-
 stances, besides the necessity of taking in
 nourishment, render such a distribution
 of life impossible.

* Quoties bellum non ineunt, non multum vena-
 tibus, plus per otium transigunt, dediti somno ci-
 boque. Fortissimus quisque ac bellicosissimus nihil
 agens—mira diversitate naturæ, cum iidem homines
 sic ament inertiam et oderint quietem.

Tac. de Mor. Germ. 15.

Hence

Hence arises the necessity of subdividing the waking state into the terms of business and recreation.

From the eagerness with which it is carried on, and the necessity of making every advantage of present occasions, the pursuits of business generally exhaust the system to a greater degree, than could be supported through the whole waking state; besides that to furnish, what I have before called the *fund* of activity, nourishment is necessary, which, if it is to succeed completely, should be as little as possible interrupted by attention to business. Still the attention, while a man is awake, must be fixed upon something, otherwise the obtrusion of accidental images will disturb the head, and interfere with the useful associations.

Amuse-

Amusement then is such an employment as occupies the attention without fatiguing it, expending considerably less of the *fund*, than is expended by business.

In men of very strong parts, and who have early in life so habituated themselves to the investigation of certain parts of nature, joined with corresponding actions, as to be thoroughly familiar with the leading principles, and to have acquired great readiness in combining them, in such a mere variation of employment may produce every end of recreation. The business of Newton was to explore the recesses of natural philosophy, and his amusement, to improve the science of chronology.

But

But amusements cannot answer their end, unless in adults they be such as a man has been accustomed to, and such as in themselves are not disagreeable.

Why actions that are performed without reluctance, and such actions as we are in the habit of performing, should expend less of the active fund, than those of another description, has been shewn in a former part of this work.

Upon the amusements of men of business, it is unnecessary to say much. Whatever answers the end of recreation is proper for them, provided they are careful to introduce, either into their business or amusement, as much exposure to the open air as shall keep them
in

in health. So much for the amusements of men of business.

Men of large independent fortunes have frequently little employment deserving the name of business. Hence, if otherwise in health, they have generally such a superabundance of the active fund, that it becomes troublesome, and their principal occupation is, to find active amusements that shall exhaust it.

Consequently the amusements of men of this description leave more scope for discussion.

In every political state it is desirable, that the activity of all its members shall, as much as possible, turn to some useful account. If therefore matters could be so contrived, that the same actions, while

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they

they amuse the performer, should benefit the community, who would not rejoice? I may venture to assert, that the pleasure of him, who enjoyed the amusement, would be greatly increased by the consideration, that he was at the same time serving his country.

In the course of this work I have endeavoured to shew, that any habits, not contradictory to human nature, might be inculcated by education, and that the pleasure of repeating old habits is nearly the same, whatever those habits may be *.

We see every day expensive and fatiguing courses of education pursued, for the purpose of qualifying young persons

* Sect III. Chap. I. p. 111.

of the higher classes for elegant amusements. But after all these well-meant endeavours, they end at last in mere amusement, and not always in that.

Let then some of our men of rank and fortune struggle in early life through the difficulties of science; and science, I dare answer for it, will ever after prove their chief delight; while, with the collateral advantages they will bring to them, their studies must redound to the no small advantage of their country.

I shall point out some of the studies which I think best adapted to the situation of persons in the higher walks of life, after first saying a few words to obviate objections.

The chace is an amusement deserving the highest encouragement. It is one of the most healthful, and by no means the least useful among fashionable recreations. It gives occasion to the breeding of a more generous race of horses, which, after serving the ends of pleasure, are employed in facilitating the operations of trade.

The example of an individual, who is now at the head of one of the most important departments of the British government*, and his is not a solitary instance, may shew that a passionate love of the chace does not incapacitate a man for useful pursuits of a very different kind.

* March 20, 1797.

It is very natural for men of independent circumstances to prefer sociable amusements to such as are solitary, which, it must be owned, scientific pursuits almost necessarily are. But no man would ever think of proposing study to such persons as their sole amusement, or even that all of them should have recourse to it at all. I go no farther than to wish, that study may become somewhat more fashionable among men of rank, than it is at present. They would derive at least this advantage from it, that they might be more independent upon sociable amusements, which in their very nature cannot be always commanded.

The first study I would recommend to the higher orders, is that of politics; by which I mean not the politics of a faction,

but the knowledge of human nature in its fullest extent, as contained in the most authentic and best written histories. Upon this subject, I am inclined to think, much greater certainty might be attained, than men in general believe. And who so proper to prosecute the study of politics with success, as men who having access to most situations of life, can examine the human powers in every possible modification ; and who, by their influence over the lower orders, can with equal ease encourage any real improvement, and prevent any dangerous innovation from imposing upon the less informed minds of their inferior brethren ?

That the application of the science of politics to the progressive improvement of society is both desirable and practicable, the

the times in which we live will excuse me the trouble of proving.

On the subject of politics I cannot refrain from recommending two works, which, though not without faults, will seldom mislead a man accustomed to examine the thoughts of others, with the same attention, which he would employ in writing down his own. I mean Hume's Essays, and Bolingbroke's Letters on History.

Every science connected with the common arts of life, but which cannot be prosecuted without an expensive apparatus, such as chemistry and astronomy, should be considered as the peculiar provinces of the great. And indeed in-

stances of their coinciding in opinion with me are by no means wanting.

Agriculture, as a branch of chemistry, might receive the highest improvements in the hands of such men as I am now considering, who, as their fame and fortune do not depend upon the success of any single attempt, might boldly launch into the ocean of experiment, guided by the compass of science, of which the suggestions, though not determinate enough to prevent the pleasing surprize of discovery, will yet, if joined to the directions of common prudence, be sufficient to secure them from great hazards or dangerous losses.

Before I conclude this subject, I cannot help remarking, that one reason why
men

men of independent fortunes so seldom seek their amusements in scientific pursuits may be, that they see no utility to be derived from such pursuits to men in their stations of life. If I succeed in pointing out the near relation which subsists between the maxims of active life, and the depths of mathematical and physical science, perhaps curiosity may induce some of those, who are best acquainted with the former, to trace them to their foundation in the latter; and if so, I am willing to hope, that when once engaged in such studies, they may find them neither so abstruse, nor so uninteresting, as they are apt to imagine.

Our island abounds with a set of independent men of a peculiar description,

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to

to whom the study of politics, in the extensive sense of the word, as before defined, is particularly adapted. I mean men of small and moderate fortunes, who have had the advantage of a liberal education. That study may be prosecuted to advantage, at no very great expense, books, and an extensive acquaintance, being the principal requisites. All that a person of this description has to observe, is to take such measures, that he may be under no temptation either to advance falsehood, or to conceal truth*.

In the mean time, those who are addicted to other recreations, such as music or drawing, may, if they can please

* Ne quid falsi audeat dicere, ne quid veri non audeat.

themselves,

themselves, reflect with satisfaction, that their pleasures are both innocent and liberal, though I cannot allow them to possess any high degree of utility.

CHAP. VIII.

On Passion in general.

THERE is a three-fold division, which includes every species of action to which an human being is liable.

In the first place the occasional cause may be applied to a part of the body, with which the brain is no farther connected, than as it makes a part of the same system. Such is, for instance, the action of the bowels, such is the action of the heart.

In

In the next place, the occasional cause may be applied to the nerves, with which the brain is more immediately connected as an organ of reference, and the source of one kind of motion. And this application may be of such a nature, that the motion may be arrested in the brain, and by the intervention of a slow deliberate process, which is transmitted in some measure through the whole of the brain, and influenced by the whole character of the man, be at last propagated into the muscles, and produce the usual voluntary actions of life. Such are those actions which we have hitherto been considering.

In the last place, the occasional cause may be applied to the nerves, and its effect propagated to the brain, as in the former division;

division ; but instead of slowly diffusing itself over the whole brain, and being influenced by the whole character of the man, it may by an hurried process seize upon some one idea, which had been generated formerly by a sensation similar to the present one, and by that idea be forced on into the muscles, producing with the same rapidity the action which has been usually joined with the same sensation. Such is the nature of passion and passionate actions.

My readers are to consider this treatise, in all its parts, not as a finished work, but as a collection of detached specimens of a new system, the chasms of which may be filled up at some future time, and the whole have a more compact form given to it, if the author shall unite the advantages

advantages of life, health, leisure, and encouragement.

In the mean time, he has so much confidence in the justness of his notions, that should any reader dislike his selection of specimens, and wish to see the light of his theory thrown upon other parts either of natural or moral philosophy, the author is ready to gratify such reader, after a reasonable indulgence of reflecting upon the subject, should it happen to be new to him; and is willing to rest the solidity of his system upon his being able to solve any problem to which his doctrines can, upon a fair interpretation, be construed to extend.

After this introduction, the next chapter will treat upon the passion of shame.

CHAP. IX.

On the Passion of Shame.

I SHALL be content, if my manner of treating this subject shall be found solid by the *judicious*, and delicate by the *candid*. Universal approbation is what I must not expect.

The two leading facts respecting it are, a certain mental feeling of the unpleasant kind, and a preternatural redness of the face and neighbouring parts. These are found so generally to go together, that I may take for granted their
standing

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standing to each other in the relation of cause and effect.

Consequently our theory will receive no trifling confirmation, if by its means we can connect these two facts together, especially as this has never yet been done in a satisfactory manner.

I shall begin at both ends; and first examine what is known concerning the physical cause of blushing, next enquire into the nature of that emotion called shame, and then point out how the one naturally produces the other. The introduction of this subject is the more proper, as to shew the dependence of a physical fact upon a passion of the mind, is literally to point out the connexion between natural and moral philosophy.

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A young

A young and healthy human subject generally has some degree of ruddiness in the colour of the face, particularly about the centre of the cheeks. This red colour is proved by anatomists to depend, not as one would at first suppose, upon an uniform diffusion of a red substance through the texture of the cheek, but upon the blood contained in an almost infinite number of vessels, and shewing its colour through the transparent skin.

This appears beyond controversy from preparations of very young dead subjects, injected with a red matter, by means of which the appearance of an uniform red is produced, in a degree which, to the naked eye, suggests the idea of paint.

It

It is likewise well known to physiologists, that the red blood in living subjects circulates at different times more or less completely through the extreme arteries; hence from various causes, the same part is at some times more deeply tinged with red than at others.

These causes may be reduced to two heads; to that of stimuli applied in the cellular substance, to the outside of the extreme arteries; and to that of an unusual defect of that resistance in the cellular substance, which in general prevents the blood from penetrating beyond a certain extent in the arterial system.

The temporary nature of blushing concurs with other causes, to be mentioned hereafter, in pointing out the first of the

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above-mentioned heads, as that to which the redness of blushing must be attributed.

But it is now time to begin at the other end. Let us then enquire, what states of human life are most liable to feel shame, and to exhibit the redness of blushing. And it will occur upon the slightest reflexion, that this is the case with children and young women. Now the chief circumstances in which those two descriptions of mankind agree, are, that they are under subjection; and that they possess naturally a frame more delicate and irritable than elderly women or men. The effect of subjection is to weaken resolution, and to render us more fearful of shocking those by whom we are governed. It will soon be perceived, that both these
circum-

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circumstances unite their influence, to render women and children more subject both to feel and to shew the emotion of shame.

Our next enquiry must be, in what circumstances of the persons just mentioned, do we find those phænomena occurring most frequently, which are the subject of our present examination. And from the consideration of many particular instances, it will appear, that they are never more apt to occur, than *when we fear that any part of our character has become public, which we hoped had been known to ourselves only; or, which amounts to the same thing, when any idea which we really possess, but wish to conceal, is excited in our minds against our will.*

Thus while nature inspires a young virgin with the lively desire of being a mother, and education very properly teaches her to conceal that desire, any pointed allusion to that or similar propensities will overspread the face of sensibility with a blush. Here an emotion, which it was hoped had been concealed within the breast of the sufferer, is in her opinion at once made known. I need not add that to make the experiment requires a rudeness of manners bordering upon cruelty ; my business is not to give moral lessons, but to establish philosophical principles *.

* It may be necessary to warn the unwary reader, that the author's observations were made in the country, and in middle life. In very high and very low life, and pretty generally in the metropolis, he is inclined to doubt whether the experiment would succeed.

There

There is a particular case, in which the effect is remarkably heightened; and that is, when the general instinct has been confined and strengthened by being directed to a particular object. In this case, while the voice of nature is strong, pride and prudence unite to whisper concealment. It is not therefore to be wondered at, that the slightest hint respecting the beloved object seldom fails to be followed by a blush.

A school-boy, taken in the act of pilfering, must be more brazen than school-boys generally are, if he does not both feel and discover the emotion of shame.

When the noted Lauder first perceived that his scandalous attempt to rob Milton of his laurels had been defeated by

Johnson; when Davis found himself convicted by Gibbon of much ignorance, many mistakes, and some disingenuous practices, we will hope, for their sakes, that they both blushed.

The intention, as far as it is connected with decorum, of civilized nations, in hiding their bodies from the view of their fellow-creatures, is not so much to moderate their irregular appetites; for it may be doubted, whether in that respect habit would not do more for us than all the arts of concealment; but to prevent us from unintentionally discovering to each other those emotions, which a variety of motives induce us to keep to ourselves. Some of these produce effects so sudden, so involuntary, and so conspicuous, that without the assistance of dress, an attempt
to

to restrain them would only add to the certainty of their appearance. At least these seem to be the views by which the modesty of individuals is directed, though something may be allowed for public opinion and the habits of education.

The original question is now reduced to this: how does the exciting an idea against a person's will cause an unusual number of minute vessels about the face to be filled with red blood?

We may perhaps help ourselves in the farther conduct of this disquisition by the following intermediate position, which shall be proved elsewhere. "The possession of a system of ideas, which we have no opportunity of employing, is always attended with general languor."

And

And if the ideas which composed this system were at first suggested by any natural propensity, which must itself be restrained, the effect is the more considerable. How languid is a man brought up in republican principles, while living under the restraints of a despotic country ! He has a propensity to assert his natural liberty, but as it is impossible for him to indulge that propensity, his next wish is to descant freely upon his natural rights ; but being forbid the use even of his tongue and pen, every channel of interesting action is choaked up.

Another general truth, which I have in some measure anticipated, is that whenever the action, naturally suggested by any particular idea or propensity, is rendered impossible, some relief is obtained

by making such idea or propensity the subject of conversation. Thus a lewd man has some satisfaction in talking obscenely; an angry man is relieved by passionate language, and it is well known that the utterance of an oath, or a term of invective, will alone cool a moderate passion.

In every case where an existing idea *must* be suppressed, there is a degree of the above-mentioned languor, in proportion to the extent and importance of the idea. An idea never can be excited against a person's will, unless the total of the existing causes be superior to his contrary resolution to suppress it; that is, the power of those causes must be superior to his whole voluntary power. And
here

here we see, by the way, why delicacy, or weakness with sensibility, predisposes to the emotion of shame. But to return: as we need not accurately calculate the exciting powers, it is enough to say, that they must be very strong, and of course the idea thus involuntarily excited must be *forcibly* excited: indeed it will be somewhat less so, because an idea which by supposition has been some time dormant, will be *readily* excitable: but this very circumstance, while it diminishes the strength, will add to the diffusion of the effect.

The excitement of an idea operates like any other stimulus applied without the blood-vessels, determining a greater quantity and higher quality of the blood to the
part

part excited : this part being within the encephalon, of which the confined capacity cannot receive much more blood at one time than another, the furplus is distributed through the system of the external carotid; *i. e.* all the blood-vessels of the face and neighbouring parts will both have more colour, and what they have will be of a more lively dye, than in the usual circumstances of the same person.—*Q. E. D.*

This doctrine is confirmed by the effect of exciting an idea against the will of a choleric man, which always makes him angry. Indeed shame and anger are in some points of view nearly allied. The same circumstances which make a
soft

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soft and gentle disposition, either in man or woman, feel ashamed, will throw a strong and haughty character into a fit of anger.

CHAP.

C H A P. X.

On Hobby-horses.

NOTWITHSTANDING the title of this chapter, my reader is not to imagine that it is to be of a ludicrous nature. The word hobby-horse is with me a term of art, signifying an unremitting ardour of pursuit, confined to one subject, and not kept up by the usual inducements of pecuniary emolument, necessity, or duty.

The necessity of hobby-horses arises from some defect in the constitution, making the circulation of the blood to depend,

pend, in a great measure, upon the application of stimuli to the outside of the minute arteries. Hence they become more and more necessary as life declines, and the avarice of old age may be considered as a hobby-horse, called for by the decay of the active powers of life.

There are two very remarkable instances of hobby-horses, which will serve to exemplify the position just laid down. I mean the avarice of Elwes and the benevolence of Howard. In both instances their biographers have been so usefully accurate in relating the particulars of their lives, that the defect of constitution, to which I have referred hobby-horsicality, is established beyond contradiction.

If

If I am not greatly mistaken, the species of weakness which occasions the disposition to adhere to some favourite pursuit, consists in weak spirits originally acted upon by a superabundant genital stimulus, owing frequently to original conformation, but sometimes a too early indulgence in venereal gratifications.

Cæteris paribus, a generous and rather stimulating diet diminishes the necessity for having recourse to hobby-horses; and this is one reason why poverty and authorship are so often found united in the same person. The fact I can vouch for, having known the experiment frequently made, and constantly seen, that a certain restless activity, the spur to much strenuous literary exertion, has been

O greatly

greatly diminished by a regular course of generous living.

When the celebrated historian Hume was asked why he did not continue his interesting History of England down to the present times, he assigned three reasons for his indolence, viz. that he was too old, too fat, and too rich.

There is in this kingdom a character of rank sufficiently known to deserve quotation, who, during the more sprightly years of his life, was a man of pleasure, but has lately retired from the world, and is contented to amble away his future days upon the gentle-paced hobby-horse of *methodism*.

In

In general there are two sets of causes, which supply the human frame with its more active parts, and which, though in some measure opposite, may to a certain extent be substituted the one for the other. The causes to which I allude are those which furnish the blood and spirits on the one hand, and those which exhaust the finer secretions on the other.

There is, it seems, a necessity that the secretions should be changed from time to time, that they should be regularly exhausted and replenished, as I have mentioned under the article of Happiness.

If the system be sound and properly nourished, the restoration of the secretions follows their exhaustion of itself,

by the very mechanism of the body. But that exhaustion must always be preceded more or less by moral inducements.

If the system be very moveable, and the nourishment generous, very slight moral inducements will answer the end, but in a less moveable state of the system, and with coarser fare, stronger inducements become necessary. It is owing to this circumstance that the poor clown both wants violent exertions and can support them; while his more delicate lord neither could support similar exertions, nor finds himself at all inclined to undergo them.

To these causes may be applied a very general law of nature, which I had occasion to touch upon before, under the
head

head of Apparitions. The law is, that wherever two contrary sets of causes conspire in one action, although that action may be divided between the two sets in an infinite number of ways, so as still to take place in some measure, yet that the greatest effect always ensues from its being *equally* divided between them.

Thus an human being may be tolerably easy with very slight fare, if he be careful to ensure a regular application of moral inducements adapted to the nature of that fare; and this is done by mounting an hobby-horse.

On the other hand, he may depend upon accident for a sufficient application of moral inducements, provided he have a constitution to bear, and a fortune to

afford a very nourishing and generous diet.

But the most eligible way, where circumstances will admit it, is to unite the two to a certain extent. To have a mind so fraught with information, and so habituated to attention and reflexion, that objects of curiosity may meet you at every turn, and at the same time such a constitution and such circumstances, as will ensure you a copious supply of good blood and vigorous spirits.

The subject I have just now discussed furnishes a very natural transition to some which are to follow, and which are more of a medical nature than any that have yet come before me.

CHAP.

C H A P. XI.

On Death from a Broken Heart.

THERE is a particular mode of dying, commonly called dying of a broken heart, the nature of which is perhaps not generally known.

Love, friendship, chearfulness, and all passions of a similar nature, have, while they last, a very kindly effect upon the vital motions, as has been mentioned and explained before. But these emotions have the disadvantage of all other stimuli, that by habit they become essential to comfort. Their cessation there-

fore, when they have once become habitual, always more or less impedes the motion of the heart and arteries, and produces in the first instance that peculiar uneasy sensation, which medical writers call anxiety, of which a high degree constitutes the *tædium vitæ*. But farther, as the fluidity of the blood itself depends in a great measure upon its motion, a spontaneous coagulation is apt to take place, even in the living blood-vessels, as soon as there is any considerable impediment laid in the way of its motion, producing what is generally called a polypus. While these changes are going forward, the preternatural accumulation of blood in and about the heart stimulates it to frequent vigorous but ineffectual contractions, which, in a way to be explained in another place, extend, enlarge,

large, and even sometimes burst the substance of the heart itself.

The same phænomenon now and then happens, as in the instance of our late king, without any considerable influence of moral causes. But in the life of Dean Swift by Dr. Sheridan, there is a very accurate account given of the death of that author's father, soon after finding that he had lost the place he formerly held in the Dean's friendship, from all the particulars of which, with Dr. Henshaw's opinion, and the dissection after his death, it appears to have been clearly a case of death from a broken heart.

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CHAP. XII.

On Opium and Wine.

FOR some time past it has been usual with the younger part of medical writers to maintain the paradox, that wine and opium act in every respect in the same way, and that the one may be generally substituted for the other. Yet I have always doubted the sincerity of their conviction, when I considered, that they had never yet prevailed upon one Englishman to exchange his pipes of port for lumps of opium or phials of laudanum. Nay, although the present style
of

of living renders wine to a gentleman of indispensable necessity, while the difficulty of public affairs makes it a very expensive article, yet I never met with one of my brethren, however straightened in his circumstances, who could prevail upon himself to substitute opium as a cordial for wine. Notwithstanding this, as the opinion above-mentioned has been supported with some shew of reason, it may be worth our while to examine into the real nature of wine and opium, in what they agree, and in what they differ.

The most obvious effects of opium, in ordinary habits and circumstances, are to allay irritability, ease pain, and procure sleep.

Whoever

Whoever has digested the theory of this little work, will immediately see the conclusion to be drawn from these facts, which is, that opium has the property of absorbing *Calorique*, and of course, when brought into intimate contact with a living body, of diminishing the quantity of its life. How it produces either death or sleep in this way I need not shew. It eases pain, because pain is, *cæteris paribus*, as the life of the pained part. It allays irritability in the following manner :

An irritable make, by which I mean such an one as is possessed by women and children, consists in the *Calorique* of the cellular substance being so diffused, as to be in a very rare state, owing to the contractile power of the cells being too
weak

weak to resist the expanding power of the contained *Colorique*. The proper cure for such a make is to increase the contractile power of the cellular structure, which condenses the *Colorique* without any waste. But relief may be had by diminishing the *Calorique* itself, and this is done by opium.

This theory of opium will readily explain all its other known properties, viz. that it is a cordial in hot climates, but a pernicious sedative in cold ones; that it wonderfully assists the strengthening powers of wine, and that, unless when given in very large doses, it has a tendency to increase inflammation.

In hot climates there is no want of *Calorique* in the atmosphere; but the misfortune

fortune is, that (not being applied to the human body in a state of combination, as when healthy men in cold climates breathe pure air, and at the same time use exercise) though any waste of *Calorique* be easily repaired, yet that substance is always communicated in a state of rarefaction, requiring the absorbent powers of opium to condense. In cold climates, on the other hand, *Calorique* can only be acquired by breathing pure air and using exercise, for which the taking of opium incapacitates a man; hence, when taken largely, it condenses indeed, but at the same time wastes the *Calorique* or life of the body, and is of course highly destructive*.

By

* As an instance of the bad effects of an habitual use of opium in these climates, I can refer to a case, which may be known to some of my medical readers.

By wine, as by the natural temperature of a hot climate, large quantities of *Calorique* are successively thrown into the system, but in such a state of diffusion, as makes the use of opium or exercise necessary to convert it into real strength.

Inflammation arises generally from the presence of oxygen in the cellular texture in an over proportion, by which the *Ca-*

readers. The man was some years ago Secretary to the Royal Physical Society of Edinburgh, and had accustomed himself to take large quantities of opium, till he could not support existence without it. And truly a more pallid, enervate, emaciated figure never walked the earth. I have likewise known several ladies who had acquired the same pernicious habit; but as their circumstances enabled them to join with it a generous use of wine, the bad effects of the opium were on that account less apparent.

lorique

lorique of the neighbourhood where it exists is assimilated to the dense state in which it is found in pure air. This condensation is of course increased by a moderate dose of opium, while a very large one, by absolutely exhausting the inflamed part, may remove the inflammation, unless its cause be of a very obstinate or recurring nature.

CHAP. XIII.

On Medical Statics.

ALL those, who have made experiments upon Medical Statics, are agreed in the following positions :

1. That a human body often feels lighter, when it is really heavier.

2. That it often feels heavier, when it is really lighter.

3. That it always grows considerably lighter upon sleep.

P

4. That

4. That all exciting passions render it both apparently and really lighter.

5. That all depressing passions render it both apparently and really heavier.

In their explanations of these facts they have always hitherto deduced every increase of weight from the retention, and every diminution of weight from the discharge of insensible perspiration.

But this explanation seems not perfectly satisfactory, because,

1. It is proved by unquestionable experiment, that the body inhales, as well as exhales, by allowing for which, the quantity of insensible perspiration, already incredibly great, must be supposed still greater ;

greater ; since the loss attributed to insensible perspiration will be in fact only the difference between inhalation and exhalation.

2. As the diminution of weight from exciting passions takes place with great rapidity, it is difficult to conceive how the whole should be owing to perspiration, without that perspiration, in a body covered with clothes, becoming very sensible.

3. As the diminution of weight which takes place in sleep is the constant attendant upon healthy sleep, even where the warmth of the climate renders covering unnecessary ; and as all the circumstances of sleep tend rather to diminish than increase evacuation, and do in fact

diminish most other evacuations; for both these reasons it is not probable that the *whole* loss of weight during sleep should be owing to perspiration.

I mean not to deny that anger and joy really increase perspiration, nor that sleep, in ordinary circumstances, has the same effect: but only doubt whether some other principle ought not to be called in to our assistance towards the explanation of the above-mentioned phenomena.

That joy increases perspiration every body knows, who has attended to the difference between drinking alone and drinking in jovial company.

That anger increases perspiration I can never doubt, since I have repeatedly seen a very passionate friend of mine, after a
fit

fit of furious anger, under the necessity of calling for a towel to dry his face.

That sleep increases perspiration may be shewn by simple inspection of a night and day-covering.

That when a determinate weight of food adds the same weight to the human body, which returns after some time to its former gravity; that then a portion of gravitating matter, equal to what had been taken in, is again thrown off, cannot for a moment be doubted.

But still there is room for questioning, whether a given weight of nourishment has not, by the very act of assimilation to a human body, and by the consequent addition of condensed *Calorique*, part of

its weight suspended, while it continues vitalized, and restored again as it parts with its vitality in the various functions of life.

This consideration will readily explain the difference between feeling heavier and weighing heavier.

CHAP. XIV.

On mixing Constitutions.

FROM what has been said it will readily appear, that there are rarely to be found two constitutions exactly of the same crasis. Not only, as St. Paul says, there is one flesh of men, another of beasts, another of fishes, and another of birds*; but even among men there are no two who exactly agree. But as diversity has been shewn to be the foundation of action, the mixing of different constitutions will frequently be followed by action.

* 1 Cor. Chap. xv. 39

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Accordingly we read of instances in which two ships crews, which before mixture were to all appearance free from disease, became suddenly, upon being put on board the same ship, infected with a dangerous fever. The men of each ship had, from being long confined on board, contracted a peculiarity of constitution, of which the effluvia of their perspiration must necessarily partake. And the peculiarity of the ship A being of one kind, while that of B was of another, when brought together, the mingling of their animal effluvia would naturally produce a *tertium quid*, by which a fever would be generated in both the crews, each of which, though accustomed to their own peculiarity, so as not to suffer from it, was liable to be affected by the new production.

Another

Another example of mixing constitutions occurs in the transplantation of teeth, a process which has not unfrequently been succeeded by the most dreadful malady, beginning between the new tooth and its socket. From the resemblance it bore, both in its symptoms and mode of cure, to the venereal disease, a venereal inoculation has been generally suspected, and may occasionally have occurred. But the late Mr. Hunter has proved, I think in the most satisfactory manner, that the same disease has often taken place, when no venereal infection could possibly have existed. Upon the principles I have laid down, the fact admits of a ready explanation.

A third case of the mixing of constitutions occurs, when distant nations begin
for

for the first time to associate with each other. Nations inhabiting distant parts of the world, between which there is no communication, must acquire a peculiarity of constitution similar to that of the ships crews just now mentioned, but much greater in degree. When therefore they intermix the first time, especially if the connexion be of a very intimate kind, a reciprocal action of one set upon the other will take place. From such an union of the Egyptians, Israelites, and Canaanites, arose the leprosy. From the mingling of Asiatics with Africans, and with Europeans, the small-pox was generated; and from the mingling of Europeans with Americans, at the time of the discovery of the new world, was produced the venereal disease.

It

It is a strong confirmation of this idea, that when the Danes first began to visit Greenland, and the English New Holland, the small-pox broke out among the inhabitants; and that soon after the discovery of the South-Sea islands, the venereal disease made its appearance among the natives, though it was not known that any individuals in the European ship had been previously infected with that disorder.

With respect to the small-pox it may be necessary to add, that upon the principles which I shall lay down in regard to that disorder, every human being who has had it may be considered as constituting a saturated solution of the infectious matter. This state of frame, while it ensures all such individuals from the
danger

danger of taking the infection themselves, and renders them, generally speaking, innoxious to those with whom they are in the habit of constantly residing, must still make it possible for them to communicate the fomes of the disorder to foreign nations, and perhaps even to infants of the same nation, who have not been seasoned to it.

CHAP. XV.

On Animal Courage.

THE subject of this chapter is of that kind, which, if strictly considered, ought to have been introduced in the foregoing section, courage being one of those properties which the human species has in common with many others. But as all similar subjects are treated chiefly with a view to the application which may be made of them to our fellow-creatures, there is no great impropriety in having reserved the present for this place.

Before

Before entering upon a philosophical disquisition concerning the causes of courage, it may be necessary to warn the reader, that there is one occasional cause upon which the present state of our manners makes it very difficult for an author, who addresses himself to the public at large, to be explicit. Yet in all discourses upon man, the cause alluded to is of the utmost importance, is calculated to throw great light upon almost every department of human nature, and is besides at present so imperfectly known, except to single individuals, that it would both require and deserve the most ample investigation. In the present work I shall continue to pay so much deference to the established manners of my country, and to the feelings of my countrymen, as to avoid the subject to the best of my power,

power, only taking the liberty to say, that as it is a branch of human nature which I think myself capable of elucidating, I may possibly discuss it fully upon some future occasion.

By courage I mean, in the person possessing it, a consciousness of equality or superiority with respect to others, and as it appears to an observer, such a deportment in others as argues that consciousness. From this representation it immediately appears that courage is a relative quality; an individual who is courageous with respect to one other individual, may be timid with respect to a third.

Although many of the ends of courage may sometimes be answered by superior understanding or information, yet animal
courage

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courage is an instinct entirely independent of reflexion or any kind of thought, and there is nothing which a person more readily feels or betrays, than his superiority or inferiority in this respect with regard to any other person.

I shall not affect to conduct this disquisition analytically, or to lead my reader through all the tortuous paths, through which I was obliged to pass, before I arrived at the result, viz. the proximate cause of courage ; but shall at once present him with that result, and hint at its agreement with some of the most general facts that are known on the subject.

The proximate cause of courage is a comparative density of the *Calorique* of life in any animated system.

That

That the vital *Colorique* of the male kind is denser than that of the female through the whole of animated nature, might be clearly shewn, had I not pledged myself to wave all such discussions for the present.

The same circumstance forbids me to shew how it takes place, that in our species superannuated males become less, and superannuated females more courageous than they were during that period of life, when the characteristic differences of the sexes existed in the highest degree.

I might indeed without offence point out the causes which establish the general superiority of animal courage in the higher ranks of society, and of the exceptions

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which

which now and then occur to the general rule. I might farther shew that this general superiority is one of the causes, and not the least powerful one, by which the distinction of ranks in society is kept up. But such a discussion would involve me in a delicacy of another kind; besides which I have so far got the habit of trusting to the sagacity of my readers, and leaving them to think on for themselves, that I will not now deprive them of that luxury.

On the head of courage and timidity in other animals, which would open a wide field for illustration, I shall present the reader with a curious passage from Archbishop Usher, and after recommending the whole dialogue from which it is taken

to

to his serious perusal, drop the subject and put an end to the chapter.

“ The fears of superstition are sentiments of the mind, which, like other instinctive sentiments, cannot be tried at the bar of reason, and yet are better established and more present than the conclusions of reason. When a horse discovers a lion breaking into the pastures, and moving towards him, he beholds in his form and terrific motion evidences of his might and fury, that will not suffer him to hesitate or doubt. If the horse were a modern philosopher, he should, at the sight of an animal so much beneath him in size, await at least, and put his force to a trial, before he drew the shameful conclusion ; he should suspect that his dread was a pre-

Q 2

“ judice,

“judice, for want of due examination,
“and he ought to summon his reason to his
“assistance. But the horse, by a secret
“light of sentiment which cannot be
“traced or accounted for, but which yet
“is very just, measures in a moment the
“power of the lion with his own, with-
“out scale or compass, without the laws
“of mechanics or geometry, and flies by
“the impresson of an internal sense.”

C H A P. XVI.

On the lymphatic System of Vessels.

MODERN anatomists have placed it beyond all doubt, that there exists in all animal bodies, (and it is probable the same holds true of vegetables) a set of vessels so constructed and arranged, as to absorb by open mouths a variety of substances, when applied to them, and to carry them along by some power lodged either in the vessels or their contents, or both, throwing them at last into the general circulating mass.

On the minute structure, and ordinary functions of these vessels, I am not now to discourse; my business is to state an opinion, I have long entertained, that the minute lymphatics anastomose freely with each other, and that by their means there is a ready communication for any substance to move between any two parts of the system, without passing through the blood.

Sydenham, whose character for philosophical sagacity in matters relating to his profession, is now established beyond contradiction, and who makes it his boast, that he spent that time in observation and reflexion, which others threw away in reading, when treating of the evacuation of dropfical waters from the abdominal cavity by the intestines, concludes
that

that this must take place by passages not generally open (*communi naturæ lege haud satis patentes*) nor indeed generally known to physiologists.

This, with many other similar phenomena, was some time ago explained in a very ingenious manner by the late Mr. Charles Darwin, from the retrograde motion of the lymphatics.

There is indeed a fact, not very common, but still incontrovertibly established; I mean, the sudden translation of pus from an abscess, in one part of the body to another, often at a great distance, by which the existence of such a motion in the lymphatics is clearly proved.

What chiefly prevents physiologists from admitting the doctrine, is, that the

natural motion of the lymphatics is certainly in the contrary direction ; and that their numerous valves seem to render such a retrograde motion difficult, if not impossible.

To the first objection we may readily answer ; that in the alimentary canal, where the natural motion is equally fixed from the mouth to the stomach, yet by the application of proper causes a contrary motion from the stomach to the mouth is easily produced.

To the second : that the minute lymphatics, between which the anastomosis, for which I contend, must be supposed to take place, are invisible to the eye, even when assisted by the best microscopes ;
and

and that, although the large trunks are supplied with valves, there is no reason to think that this is the case with the minute branches; on the contrary the analogy of the sanguiferous veins is in my favour.

C H A P. XVII.

*On three different Modes of arranging
Ideas.*

THE number of ideas, which any given head can hold, depends upon the size of the brain, or rather perhaps upon the proportion which the brain bears to the sum of the nerves issuing from it.

This number is nearly the same in different individuals of the human species, as the Bishop of Llandaff has very properly observed, and it is chiefly upon the difference of that proportion in him
and

and other animals, that the boasted superiority of man depends.

What then occasions the apparent superiority which one man possesses over another? Setting aside the difference of original strength, and that of the same kind occasioned by riches and poverty, or rather by poverty and competence, upon the different arrangement of ideas.

The love of novelty puts men in early life upon storing their brains as quickly as possible; they therefore catch at every idea which their situation puts within their reach. But when the receptacle is once full, an attempt to introduce more seems to produce that mechanical laceration of intellect, to which Festus al-

Judes in those words addressed to Paul :
 “ Much learning maketh thee mad.”
 This seems to have been the case with
 poor Rousseau, who, unless I am mis-
 taken, points out in his confessions the
 very time when the accident happened,
 the sensations it gave him, the conse-
 quences it left behind, and the causes by
 which it was brought on.

If any idea be actively useful, and
 that only in one instance, after such use
 the idea shrinks, is obliterated, and leaves
 room for the introduction of new ones.
 The mode of this process appears to me
 the following :

Let the circle A, B, C, Fig. 6. repre-
 sent the precincts of a man's brain : D
 an

an idea, with all its subordinate lesser ones, in an excited and consequently expanded state.

A, B, C, Fig. 7. is the same brain with the idea D in an unexcited state, when all its lesser ones are pressed in upon the main one, so as to take up less space, to admit E, F, G, &c. coming nearer to it, and thus leaving room for new ones.

It is in this way that by committing ideas, whether of business or science, to paper, a man finds his memory, with respect to those ideas, weakened. In the same way it is, that the art of writing enlarges the faculties of man. An useful idea, when once excited, by being committed

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mitted to paper is obliterated, and no longer burdens the memory. Yet when wanted, it may by means of the record be easily refuscitated.

There are three different modes of arrangement: 1. Filling the brain with detached ideas, which have no connection but vicinity.

2. With ideas which are detached points in an extensive system of speculation, which system may be afterwards filled up by reflexion.

3. With ideas which are detached points in an extensive system of action, and which may be filled up by experience.

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The limits of the present work forbid me to expatiate any farther upon the subject of this chapter.

S E C T. IV.

*On Man, considered as a Member of
Society.*

THE subject of this section is so important, and so extensive, that to do it tolerable justice would require a separate volume.

I shall at present confine myself to a few detached essays upon particular branches of it, and afterwards, in a separate section, subjoin a short disquisition on the nature of religion in general, and of the Christian religion in particular, with which I shall conclude the whole work.

CHAP.

CHAP. I.

On the Origin and Nature of Justice.

PHILOSOPHERS have in every age disputed concerning the origin of justice, whether its principles were derived from nature, or from convention ; whether there be any thing in the structure of our minds, which secretly whispers the obligation under which we lie, to abstain from injuring our neighbour, under pain of that remorse, which seems generally to attend a contrary conduct ; or whether he who can evade the law, and silence the voice of his conscience, be not at liberty

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to

to make interest his only standard of right and wrong,

Men unite in society for the benefit of individuals. Every individual therefore is bound to recede from the pursuit of his own interest, no farther than is absolutely necessary for the public good. Of this, however, the bulk of mankind not being competent judges, it becomes their duty to take for granted, that the legislator, by whom their government was first framed, had both the wisdom and the virtue to enact such laws as were best calculated to promote the welfare of society, and that they ought to follow them implicitly. On the other hand, he whose education and habits have enabled him to enter into the causes of things, may be allowed to conduct himself upon principles

principles more liberal. Does his knowledge enable him, by mounting to the first principles of society, so to evade the laws *, as not to bring them into dispute with his fellow-citizens, and at the same time to do more good to himself, without hurting others, or more good to others, either with or without injury to himself, than he could have done by a servile observance of the law, why should not his superior understanding be permitted to benefit either himself or the community?

* To prevent as much as possible being misunderstood, let me add, that this is only to be done by disregarding the spirit, but adhering to the letter.

C H A P. II.

On the Partiality of Man for his Species.

MAN is in the right to consider the rest of nature as being only so far worthy of his consideration, as it regards his own species: but he ought not to carry his self-love so far as to suppose the laws of nature more favourable to him than they really are. Let him labour to make his condition comfortable, but not set out with supposing it so. Let him study the earth his habitation in preference to other worlds, but not fondly suppose the whole universe made for it, and revolving round

round it; let him become better acquainted with his own species than with any other; but not at once suppose *his* made for an endless duration and infinite happiness, and others merely to serve or tease him—

“To draw nutrition, propagate and rot.”

CHAP. III.

On double Discoveries.

IN the progress of knowledge, there are certain determinate periods when the human mind is ripe for particular discoveries; when all the materials are collected, and are become familiar; and when, to complete such discoveries, nothing is required but a fortunate combination of what is already sufficiently known*.

* This fact is beautifully illustrated by Dr. Monro of Edinburgh, in the introductory lectures to his annual anatomical course, when treating of the famous discovery of the great Harvey.

To this circumstance it seems to be owing, that those who have the credit of great discoveries, are often instruments so inadequate to the production of such important effects. In fact, the whole species is the discoverer, and he whose name is transmitted to posterity is only the lucky man, who is the first to notice the discovery.

We meet with a still more remarkable effect of the same cause in the double discoveries, which so frequently occur about the same time. The arts of making gunpowder and of printing were discovered once in Europe, and again, without any communication, in the distant empire of China. The doctrine of fluxions presented itself nearly at the same period of time to two of the greatest philosophers that ever lived, Newton and Leibnitz ;

each being ignorant that the other had made the same discovery with himself *. By attending to this principle, we may readily explain a fact, which has been frequently repeated after Vellerius Paterculus, -and acknowledged to be inexplicable ; I mean, that men of unusual merit in any particular line of human exertion start up frequently about the same period of time. The circumstances of the times excite the public curiosity with respect to some particular department of human knowledge ; whence private enthusiasm comes to be seconded by public encouragement.

As in philosophy and the arts, so also in religion, there has been a regular progress among all those nations, who have

* Some late chemical discoveries were made about the same time by Dr. Priestley in England, and Mr. Scheele in Germany.

had any communication with each other, from barbarism, through various stages of improvement, up to the highest pitch of metaphysical refinement. The religious ideas of mankind, in countries where liberty of thinking is allowed, are constantly becoming more rational and enlightened.

Since then religion improves in the same gradual manner, and by the same slow accumulation of new lights, as the arts and sciences, we may naturally expect to find the above-mentioned principle extending its influence even to that department of civilization. And experience does not disappoint our expectations. The reformation of the Christian religion was begun by two distinct champions, Luther and Zwinglius, in two
parts

parts of the continent, sufficiently remote from each other to satisfy us, that in those times, when the communication between the different countries of Europe was far from being so easy as it is at present, they must have acted without any dependence upon each other.

Thus, after the barbarism into which superstition had plunged the greater part of Europe, when good sense and nature having deserted the stage, had left nothing but buffoonery and mummary in their place, on a sudden the genius of the drama arose, and at the same time nearly appeared Shakespeare, Fletcher and Johnson, in England; and after an interval Moliere, Racine, and Corneille, in France.

An

An ingenious author has even remarked, that the periods of successive barbarity and refinement have run nearly parallel with each other in countries so widely separated as Europe and China*.

* See the Citizen of the World.

CHAP.

C H A P. IV.

On Cicero's Offices.

THE practical part of this work is far superior to the speculative. In the latter a fervile attention to the doctrine of the Greek philosophers has frequently misled the author, who did not consider how far those doctrines were the result of peculiarities either in their language or studies. The truth is, Tully himself was not properly qualified, either by character or situation, for conducting philosophical disquisitions.

His

His rules for the conduct of life are adapted to the condition of persons of rank, who have an active share in the government of their country, or of philosophers and men of letters. All the other numerous and useful orders of the community are entirely neglected. This indeed cannot with propriety be imputed to Cicero as a fault: his work being intended for his son, was to be regulated by the circumstances of him to whom it was addressed; only we must not consider it as a complete system of morality; for if we examine it from that point of view, it will not stand the test of criticism.

This elegant treatise breathes throughout a republican spirit; many of the rules laid down are of a political rather than
moral

moral nature ; the duties of religion are entirely omitted.

The division of the whole doctrine of morality into two parts, *de finibus* & *de officiis*, is founded in the nature of things. The first contains general principles, immediately deduced from human nature and its natural propensities; the latter details particular rules of conduct, by which those objects may be best attained, which the nature of man renders desirable. We are therefore to study the nature of our species, and by comparing it impartially with that of other animals, to find out the proper end of his existence, and the object towards which all his actions are to be directed.

The

The most careless observer of mankind must immediately discover, that his fundamental propensity is to obtain happiness; and the experience of every individual will soon point out to him, that his happiness depends in part upon himself, and in part upon things without him. It is likewise no difficult matter to pronounce in general terms, that *he* will enjoy most happiness, whose power is fully equal to his wants. Much therefore must depend upon each man's knowledge of himself, and of the things by which he is surrounded, and liable to be influenced.

What *finis bonorum* every man is to choose; whether that of the Stoics or that of the Epicureans; whether his ultimate object shall be the perfection of his
nature,

nature, or the enjoyment of pleasure, must depend upon the result of self-examination. It is this circumstance which makes it so difficult to give general precepts of morality, precepts calculated for all mankind. The nature of individuals differs, and with that their notions of happiness; nor is it possible that the same means should lead to different ends, or that a man should acquiesce in a system of happiness deduced from a nature not his own.

CHAP.

CHAP. V.

*On a Difference, not yet noticed, between
the Epic Poems of Homer and Virgil.*

IT has been usual for critics to point out the superior degree of invention, which distinguishes the *Iliad* and *Odyssey* of Homer from the *Æneid* of Virgil; and at the same time to allow the latter the merit of superior refinement. Of this refinement the true source has very properly been said to be the age in which Virgil lived; an age when the Romans had carried all the elegant arts to the highest degree of perfection at which

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they

they ever arrived, among a people naturally warlike rather than refined.

But from a comparison of the age of Homer with that of Virgil, (and if I add with that of Milton, I shall include in my remark the three standard-epic-poems,) another very important inference may be drawn, and one which, I believe, is entirely new.

The age of Homer was rude, to a degree of which we can at present hardly form an idea. The art of writing was quite in its infancy, and such as it was there is room for doubting, whether the great poet himself was master of it.

In such an age the operation of genius must be peculiar, and Homer was unquestionably

questionably a genius, according to the more accurate definition of that word, which I shall hereafter give. Narrative is at all times one of the most pleasing sources of amusement ; for which reason men of real genius naturally endeavour to turn their talents into that channel. But it is not from the narratives of meagre chroniclers that much entertainment can be derived. Every writer, to ensure permanent success, must, while he pleases, endeavour also to instruct us. The narration ought therefore to refer, in some degree, either to public or private happiness ; or in other words, it ought to have either a moral or a political tendency.

Taking along with us these considerations, we now see in Homer a man of

genius, endeavouring to entertain his contemporaries by an interesting and spirited narration. But how does he go to work? The science of politics exists not in an age so uncultivated as that of Homer. The connexion of causes with effects, in the great events of nations, forms a prospect too extensive for the confined horizon, and unimproved organs of such early times. Every thing relating to it is resolved into the pliable machinery of supernatural interposition. Does a plague break out in the Grecian camp: Apollo sends it to avenge the cause of his injured priest. Does Ulysses, upon his return home after the sack of Troy, meet with unexpected storms in crossing the Ægean sea: he owes his misfortune to the impiety of his crew, and their sacrilegious banquetting upon the
 oxen

oxen of the sun. But the same confined views, which are so unfavourable to the study of politics, naturally promote that of manners and character. Accordingly, while the political maxims of Homer are so extremely rude and barbarous, his characters are drawn with a degree of truth, which is justly the astonishment of the present, as it has been of every enlightened age.

Perhaps the reader will by this time perceive, what it is that I am endeavouring to prove, that Homer was, properly speaking, an historian, the only species of historian indeed which so early a period of society could furnish, and considered in one light it were perhaps to be wished, that he had continued the only one of the kind. For all our

other epic poems were not the natural produce of their respective ages, but unnatural imitations engrafted upon incongruous manners. That progress of human improvement, which is dictated by unbiassed nature, leads from epic narration to the narration of history; perhaps even a period may arrive, when the mind of man, no longer satisfied with the slighter combinations of narrative, will endure nothing but the more nervous ones of philosophical deduction.

CHAP. VI.

On Historical Causes.

HITHERTO historians have attended very little to the predisposing causes of events, but have contented themselves with pointing out the occasional ones only.

As an instance of this defect, I may mention the disputes which have been kept up on the subject of antient music, and on the wonderful effects which it is said to have produced. It has been usual to look for the cause of these effects in the superior quality of the music, when

it might with much more probability have been found in the predisposition of the hearers *.

History will never furnish all the instruction which it has in store for us, till men accustom themselves to enter, in imagination, into the situation and circumstances of other ages and nations than their own ; till they cease to judge in the

* I am pleased to find my own judgment in this particular confirmed by that of so great a master in this department of human nature, as E. Burke.

“ The most powerful effects of poetry and music have been displayed, and perhaps are still displayed, where these arts are but in a very low and imperfect state.”

Sublime and Beautiful, Introd. p. 37.

See also, Herder Ueber den Ursprung der Sprache.

following

following manner: " Such effects are
" said to have been produced by such a
" cause upon such persons: I have tried
" the cause, and not finding the same ef-
" fects produced upon myself, I disbe-
" lieve the fact." Reason may fre-
quently point out to us, what effects have
been, and must have been felt by certain
persons from certain causes, though we
are incapable of feeling them ourselves.

The occasional causes of political events
are generally individuals; the predispos-
ing and proximate causes are communi-
ties; whatever depends upon the latter
must be more steady than what depends
upon the former, in proportion as the
duration of a community exceeds that of
an individual.

During

During the strength of the Roman commonwealth, disasters were often brought upon it by the misconduct of individuals, notwithstanding which the state continued to grow more and more powerful. During the decline of the Roman empire, a Trajan or an Aurelian could for a time diffuse an appearance of prosperity over the whole ; a prosperity however which ended with the lives of its authors.

When the western empire, at last, grew too feeble to keep united its own discordant parts, and had really fallen to pieces, the genius of Charlemagne could produce a temporary re-union, but it was out of his power to render it permanent.

Nations

Nations are made up of individuals : yet a number of individuals of incongruous characters do not compose a nation. There is a national character which pervades the whole, and which is found more or less in every individual.

Climate, customs, laws, manners, and a variety of occurrences are the occasional causes which produce this national character. But of these none, not even climate itself, are completely steady or permanent ; and as they change so must their effect, the national character, change likewise. Hence we distinguish the character of every nation according to the different periods of its history. This character in reference to any particular point of time, is called the *spirit of the times*.

times. Thus the spirit of the present times in England is very different from that which prevailed during the civil wars in the last century. The reason why a given occasional cause, such as the character of any conspicuous individual, produces one effect rather than another, will always be found in the spirit of the times, which is the true predisposing cause.

Nations, like individuals, and from similar causes, go through the several periods of infancy, maturity, and decay. The Roman state did this, and each petty state that has arisen from its ruins has done, is doing, or will do the same. Of the Roman state the highest point of vigour was during the age of Augustus ; of the Italian states during that of the Medicis ;

Medicis; of France, during that of Lewis XIV. and of England, during the reigns of William, Anne, and the first George. Germany seems at present approaching its acme.

C H A P. VII.

On the Inequality of Mankind in civilized Countries, and particularly in our own Island.

EVERY individual is to himself naturally the first being upon earth. Not only his own interest is what he chiefly endeavours to promote (and in so doing he acts very properly) but even in his judgments of things without him, he is apt to consider himself as the centre of the universe, and to complain of every thing that does not voluntarily step forward, and administer to his wants.

For

For me the mine a thousand treasures brings;
 For me health gushes from ten thousand springs;
 Seas roll to waft me, suns to light me rise;
 My footstool earth, my canopy the skies.

But errs not nature from this gracious end,
 From burning suns when livid deaths descend?

It is no part of my business to suggest topics of consolation for the less fortunate part of my brethren. I am of opinion, that such topics are a pernicious species of flattery, a kind of pious fraud, which seldom answers the end proposed, and which contributes in no small degree towards the propagation of error, and consequently towards the increase of human misery. My intention is to delineate things as they really are; flattering myself that my present situation affords me the rare advantage of being placed upon an elevation, where I discern the scenes
 of

of human life in their true shapes and comparative dimensions, neither distorted by partial views, nor discoloured by false lights.

Let hermits assert, that

Man wants but little here below,
Nor wants that little long,

and school-boys declaim upon the inconveniencies of wealth. In a climate like ours, no small property, and many concurring circumstances, besides wealth, are necessary towards making a man blest; and the inconveniencies of wealth, to say no more, are fully compensated by its advantages.

The climate and other circumstances being given, which determine what quantity of property will satisfy an individual

upon an average; it is clear that every country can support only a certain number of inhabitants in perfect comfort; and what men can pretend a clearer right to make up that number, than those who have been from time immemorial in the peaceable possession of it? If by any means a greater number than what the country can afford to maintain does any where exist, the supernumerary ones must exert themselves to procure a livelihood, by supplying the secondary wants of the others, and instead of envying their superiors, endeavour, by skill and industry in some useful occupation, to raise themselves or their posterity to the desirable level; and in the mean time bear with patience the inconveniencies which necessarily attach to their precarious situation.

T

Still.

Still it is but fair to allow, that if there may be supposed a state of property so diffused, as not to afford the comforts of life to any body, it is likewise possible on the other hand to imagine a state of accumulation, which would convert a nation into an assemblage of tyrants and slaves ; and as the wealth of nations has, in the progress of society, a natural tendency to accumulate, it is no doubt desirable, that human laws should be calculated to promote diffusion rather than accumulation.

And let those who at present are in the possession of wealth remember, that absolute security is unattainable in human affairs, and that the most certain way to keep possession is, joining discretion and information to their other advanta-

ON THE INEQUALITY, &c. 281

tages, to employ them with humanity and moderation. For after all, what Sallust says is true. *Quæ homines arant, ædificant, &c. virtuti * omnia parant.*

* Not in our sense of the word, but in the Roman sense, which includes strength of body and mind, with every other human perfection.

CHAP. VIII.

On Political Systems.

“ THE man of system is apt to be wise
“ in his own conceit; and is often so
“ enamoured with the supposed beauty
“ of his own ideal plan of government,
“ that he cannot suffer the smallest deviation
“ from any part of it. He goes on
“ to establish it completely, and in all
“ its parts, without any regard, either
“ to the great interests, or to the strong
“ prejudices, which may oppose it. He
“ seems to imagine, that he can arrange
“ the

he different members of a great society
 “ with as much ease, as the hand ar-
 “ ranges the different pieces upon a chess-
 “ board. He does not consider that the
 “ pieces upon the chess-board have no
 “ other principle of motion, besides that
 “ which the hand impresses upon them ;
 “ but that, in the great chess-board of
 “ human society, every single piece has a
 “ principle of motion of its own, altoge-
 “ ther different from that which the legis-
 “ lature might chuse to impress upon it.
 “ If those two principles coincide, and
 “ act in the same direction, the game of
 “ human society will go on easily and
 “ harmoniously, and is very likely to be
 “ happy and successful. If they are oppo-
 “ site or different, the game will go on
 “ miserably, and the society must be at

“ T 3

“ all

“all times in the highest degree of disorder*.”

This observation is very elegantly expressed, and with a little amendment extremely just. Were prejudices entirely abolished; were the people accurately informed of their real interests, government need then be only what it ought to be, the head, which collects the sense of all the members. But if we yield to prejudices, we make ourselves accessory to all the evils consequent upon those prejudices, and sooner or later bring on the entire ruin of our country. Man left to himself naturally pursues his real interests: he therefore who sincerely wishes

* See Smith's Theory of Moral Sentiments, Part VI. Sect. II. p. 10. vol. 2.

to promote these, may safely follow the lead of the people at large; but by an absurd education men's heads may be so filled with I know not what imaginary interest, superior to that directly before them, that by pursuing it under your direction or connivance, they may plunge themselves into all the horrors of poverty, without any alleviation but from their ignorance, or any thing to soothe their minds except the pernicious opiate of superstition. I mean not to deny the propriety of a temporary accommodation to deep-rooted prejudices; but then we ought never to account them such, but after an impartial examination, and willingly to embrace the first favourable opportunity of removing them. In peaceable times, when the resources of a nation are entire, when the constitution

continues well balanced, and good sense is the prevailing character of individuals, these circumstances may ensure an attention to their real interests in the great body of the people, though upon the important points of national concern, politics and religion, their notions may be very inadequate, or even highly absurd. But as such men have nothing to direct them, besides their own limited experience, which extends not beyond the common course of affairs, no sooner does this last come to be disturbed by any sinister events, than, as they must rely entirely upon their erroneous philosophy, they may possibly receive from that source consolation under their fall, but can never be assisted by it in any attempts they may make to rise again.

CHAP.

C H A P. IX.

On Humanity.

THE generous warmth, with which the late Dr. A. Smith, at the conclusion of the fifth part of his Theory of Moral Sentiments, inveighs against the custom of exposing infants, which prevailed among the Athenians and still prevails in China, while it does honour to his character as a man, is rather a reflexion upon his judgment as a philosopher.

Not to lose many words upon an unpleasant subject, he represents the custom
in

in question, as the height of barbarity and inhumanity. Whether it be in reality so, is a point deserving of examination, To the generality of mankind life is pleasant, and to deprive them of it, is unjustly to deprive them of that upon which they set the greatest value. But there are cases, when life becomes a burden, which it is cruelty to impose, and humanity to rid a man of. In the instance of an adult, he is himself the best judge of this circumstance, and generally takes care to let his friends know, to what degree he finds life either pleasant or the contrary. But an infant is a passive being, and under the management of others, upon whose judgment and experience its every chance for happiness depends. Extreme debility of constitution, joined with poverty, make it impossible, according to all human

man

man experience, to enjoy life. Those indulgences, which so feeble a frame requires, are rendered inaccessible, by the want of property. Why then bring up such an infant to certain misery? There is no period at which an human being can with less inconveniency yield up life, than that of infancy.

With proper limitations therefore, as just now stated, I see nothing inconsistent with rational humanity in the practice of exposing infants. The most desirable thing for infants of the description in question would be, never to have been born, but the next to that is, certainly, to be soon helped out of the world.

Next to the misfortune of being too weak and too poor, to find satisfactory employment

employment in human society, the greatest unhappiness is to have been educated in an habitual indulgence of gratifications, which a man has not health or circumstances to command. It is a misery of the same kind with that of weakly and destitute infants, and when I consider his irremediable poverty, I cannot help applauding Rousseau for the manner in which he contrived to ensure the education of his children, in the only rank of life which gave them any chance of happiness.

CHAP. X.

On good and ill Luck.

No excellence in any human attainment was ever the effect of chance. As wealth is a very common object of pursuit, there is an art of acquiring it, in which, whoever possesses excellence, will generally be conscious that he does so, and when all the world are admiring him as a lucky man, will feel, that did not modesty and even policy forbid the avowal, he might with truth claim the merit of being the author of his own fortune.

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I need hardly observe, that there are certain cases which must be excepted, cases, in which a man's fortune is made at once, by the cast of a die or the drawing of a number. But these do by no means invalidate my general position, as little as the skill of a bow-man is rendered useless, when by mere accident a perfect novice at once hits the mark. It is in complicated exertions (and such are most of those which employ men ordinarily) that the full effect of skill is seen.

Want of fortune then, where fortune is the object aimed at, implies always either want of skill, or vigour, or both. To be successful in every single undertaking is above the hope of human abilities; but skill and vigour united will always be successful upon the whole. There may
indeed

indeed be objects of pursuit more dignified than that of wealth; but let those who really want or love it, rest secure, that by far the most certain way to succeed, is to pursue it with perseverance and intelligence.

In skill is included that degree of judgment and self-knowledge by which a man appreciates the relation his abilities and situation bear to his undertakings, so as never to attempt voluntarily what circumstances have placed beyond his reach. In skill, as far as it regards the attainment of wealth, is likewise included the power of estimating, without being misguided by the natural partiality of men for their own pursuits, the state of the public market; of determining with judgment, what articles are wanted or may be brought

brought into vogue, and what undertakings, however grand or useful in themselves, must be abandoned for want of encouragement. Suppose a man to have arrived at the highest degree of skill in the manufacture of silver-broom-sticks; that man will certainly have his reward, his broom-sticks will be admired by all who see them, and he will have the honour of being called the best silver-broom-stick-maker in the nation. But while servants are agreed that wooden broom-sticks will answer the end as well, and masters of families have other calls for their money, the silver-broom-stick-maker must not expect to acquire much more than his labour for his pains.

Whatever part of nature you are working upon, whether men, or stones, if you
are

are thoroughly master of your subject, you will always gain your end. There is no thought which a good poet cannot express in verse; there is no passage which a good musician cannot execute; there is no passion which a skilful actor cannot excite; there is no resolution which a great orator cannot induce his audience to adopt. But like the orator every man must know his subject; both the one and the other must assist his main engine by every other means in his power. There are audiences whose ears are not the only assailable parts by means of which the orator

Irritat, mulcet, falsis terroribus implet

Cœu magus——

By attending to these circumstances we may easily account for two very common and striking phænomena; I mean the

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failure

failure of luck in the progress of life, and the recurrence of good and ill-luck.

With respect to the former of these, as the vigour of life decays, so must all those endowments, the causes of success which are dependent upon it; clearness of discernment, boldness of enterprize, perseverance in execution. It has been said with no less smartness than truth, that fortune is a female, who smiles upon youth, but flies from old age and wrinkles.

With respect to the recurrence of good and ill-luck; success occasions physically a temporary increase of vigour, by which future success is insured; misfortune, a temporary depression of mind which brings on fresh misfortunes.

SECT.

SECT. V.

On Religion in general.

THE progress by which human society at large acquire the art of turning the external world to the advantage of our species, resembles the progress by which each individual, in the course of life, subjects to his own controul that portion of the external world, which most nearly concerns him.

We begin by being passive observers, suffering actions rather than performing them; and the few actions we do per-

form are without intelligence, not clearly directed to any useful end ; consequently our happiness is promoted or retarded by chance, or without our knowing beforehand, when the one event or the other is likely to ensue. When pleased, we feel grateful, and love every thing which seems connected with the pleasurable state ; when chagrined, we either fear or hate the objects to which we attribute our uneasiness. These feelings in the individual produce or aid natural affection ; in the species and in large societies they produce devotion and religious awe.

In the progress of society and of the life of an individual respectively, the power of controuling nature is constantly increasing, and in the same proportion blind confidence in our parents on the
one

one hand, and religious feelings on the other, constantly diminishing.

The manner in which knowledge accumulates in society is this. Some individual looks beyond the creed of his time, and establishes his new views by satisfactory proofs. They spread through society by imitation. Sometimes, however, such superior individuals prefer making a practical use of their juster views, and by gently guiding the prejudices of the multitude, become their rulers, and lay the foundation of inequality, subordination and government. Some individuals, under the character of legislators, have united both objects, and become at once the kings and lawgivers of their tribes.

300 ON RELIGION IN GENERAL.

From this view of the progress of knowledge in society, which I have purposely given in the most concise manner, it is clear, that it must take a long time for knowledge to spread through a numerous community, and that the æras of society will be longer than those of the life of individuals, in some proportion of the numbers of society to unity.

When a new view of moral philosophy is exhibited with success, the period at which such improvement takes place is called an æra. The average-belief of any extensive community on philosophy in general, at any given period, is called the religion of that community.

As we have seen that in any extensive society an individual may look beyond the
national

national creed, so one nation or set of nations, will sometimes outstrip the rest of the species in national improvement. But neither the one nor the other superiority can be carried very far. The power of numbers is so irresistible, that an individual can never with safety go far beyond the knowledge of the age he lives in; and when he does, one or other must ensue, either his views must sink to the level of the national creed, or the creed of the nation rise in some measure to the level of his views.

But if the really-existing belief of a *single* nation be so irresistible, how much more so must be that of the species at large? For it is to be observed that the knowledge of mankind in general has its

æras, as well as that of individuals, and of distinct communities.

The æras of mankind in general which have already happened, and which, it is to be observed, fall *about* the same time, not exactly *at* the same time, in different quarters of the world *, are polytheism and deism. At present appearances seem to point out that a new æra is at no great distance, the nature of which will be seen in the first chapter of this section, which treats on Deity.

The nature of polytheism is well-known, and as being long exploded over the greater part of the world, little inte-

* A few hundred years is no great distance in such extensive considerations.

resting to the inhabitants of Great Britain.

By the æra of deism, which still exists with us, I mean the existence of religions, however different in other respects, yet agreeing in the belief of a superintendant of the world, and of human affairs in particular, who differs in nothing but magnitude of attributes from an human governor, and which is probably only an enlarged image of such a governor.

Of deism the epicycle of a future state of rewards and punishments is a necessary appendix. For, as uniform experience shews, that the distribution of moral good and evil by no means follows those laws, by which an human governor of
equal

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equal attributes with the divine superintendant would be guided, there is no way of saving the hypothesis of infinite attributes, but by the supposition of juster recompenses hereafter.

After this general view of the nature of religion, containing an out-line, which might be filled up with volumes, I shall proceed to the first chapter, on Deity.

CHAP.

CHAP. I.

On Deity.

IN this country men are now grown so refined, that the ascribing *human passions* to the Deity will scarce pass with any but the most ignorant: perhaps the time may come, when we shall begin to see, that there is not much less absurdity in attributing to that Being *human intellect*.

The use of human intellect is to direct action. Man has a power of producing changes in the external world, for his own advantage. But as it is not every
random

random change produced by the action of a man without thought, that will turn to his advantage, for this reason, in pursuing his interest, man is under the necessity of taking the following distinct steps. 1. He must, by experience, gain a clear idea of what change in his present situation would be for his advantage. 2. He must, by observation, gain a clear idea of the present state of the external world, so far as it relates to him. 3. He must, by experience, know the kind and degree of power, by which he is able to change the external world. 4. He must by habit have acquired great expertness in producing changes by his own powers, in the world without him.

It is scarce necessary for me here to caution the reader against supposing, that
every

every human action must proceed in the methodical manner just mentioned. For my purpose it is sufficient, that the method I have laid down is that in which a perfectly wise *man* would act upon an important occasion.

Let us now suppose a race of men to exist, who are really qualified to practise what a few visionaries have in all ages attempted in vain ; who are *all* intellect ; to whom food, drink, clothing, and the commerce with their fellow-creatures, are alike unnecessary ; who having their heads stored with ideas (we will not now examine *how* acquired) find a never-failing source of pleasure, in throwing those ideas into every possible combination ; *one* such man would give us, upon a small scale, a representation

presentation of the true philosophical notion of the Deity.

The Deity is to the universe what our active powers are to our bodies, or rather to our brains, the seat of our intellects; for in reference to our intellects, even our own bodies must be considered as a world without us. In the universe as in the human brain, the power resides in, and animates that upon which it acts. Here no previous experience, no observation, no working after a plan are necessary. The cause for exertion arrives, the exertion takes place, the effect ensues: all this is instantaneous, as the starting of a bright thought in a poet's mind; a process indeed which bears the nearest resemblance to the operations of Deity.

A being

A being without wants can have no occasion for the human mode of employing means to gain ends; whatever looks like an instance of that process in the works of creation, appears, upon a nearer scrutiny, to bear a different interpretation; as shall be shewn by several instances in their proper places. Here then is an end of the doctrine of final causes, that bane of all true knowledge and chaste philosophy. The only want that can with propriety be ascribed to the Deity, is that of acting; but the same cause, which in any particular instance occasions the necessity of action, determines also the quantity and direction in which it is to be excited.

This definition of Deity and of divine power, which makes universal space to be

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as it were the sensorium of Deity, while things are the ideas, and the changes which take place in the universe the operations of the divine mind, agrees in the main with the Mosaic account of creation; an account which is evidently the production of a vigorous mind, aiming, at too early a period in the progress of human society, at philosophical truth. The instantaneous effect of the divine wish is well expressed in those words: "Let there be light, and there was light." Milton's account, on the contrary, how God grasped the golden compasses, and sketched the vast circumference, is like similar expressions in the Psalms, mere poetry, the effusion of a warm imagination, tracing with boldness inaccurate resemblances between the great operations of nature, and the petty artifices of man.

After

After all it is but justice to allow, that if I except a few philosophers of exalted understandings, I stand single in this opinion of Deity, having literally all the world against me. The idolater, the Mahometan Theist, the Christian Theist, the Chinese Theist, the philosophical Deist of the present times, all seem to agree in supposing the Deity to be not only distinct from nature, but existing beyond it, in the same manner as the spirit of a man exists beyond the bounds of the materials from which he is composing any human work.

I will not give to my ideas a greater appearance of certainty, than that, to which in my own opinion they are entitled. That there are active powers lodged in the very materials of nature's works,

of strength sufficient to produce most of the operations of nature, both moral and physical, is an undoubted fact ; that even those uncommon occurrences which deviate most from the ordinary march of nature, do in fact follow the general analogies, and may be reduced to fixed laws, is no less certain ; yet the negative, that there is *not* a reserve of power beyond the bounds of nature, operating occasionally, and suspending her ordinary laws, this negative is not easily proved. The common opinion upon this subject may be just, for any thing I can demonstrate to the contrary. All I contend for is, that it is equally impossible to prove the truth of such opinion ; that the premises generally employed for that purpose do not warrant the conclusion drawn from them ;
and

and that, as far as human judgment can hitherto penetrate, the idea I have given of the matter is the more probable of the two.

CHAP. II.

On Providence.

NOTHING is more common, than for men to ascribe to divine Providence whatever favours the interests either of themselves, or of the community to which they belong. To be consistent they ought to ascribe all their misfortunes to the devil ; and then nothing would happen naturally.

St. Pierre attributes his escape from the diseases prevalent at Madagascar, which carried off numbers of his countrymen,

trymen, to a divine Providence, preventing him from going thither. Of course all who were not so fortunate, and who died in that island, had an equal right to ascribe their ill-luck to the devil ; and between those two powers we should have the easiest kind of child's-play-philosophy in the world.

But unfortunately fashion has robbed the poor devil of his perquisite. Suppose a fire to break out in any town, where the greatest number of houses lie to the west of the conflagration. If an east wind happen to blow, the whole town is consumed ; and the accident is described with every proper lamentation in all the newspapers. But let the wind set in from the west ; the town escapes, and

we are gravely told, that had it *blown from the east the whole town must inevitably have been consumed, but that *providentially* the wind was westerly.

CHAP.

CHAP. III.

On Church Establishments.

WE have seen that there is a natural progress in the knowledge of human society, and that the department of knowledge, comprehended under the term religion, is not exempted from the universal law of gradual improvement.

But as the welfare of society depends much upon the religious principles by which it is cemented, principally indeed upon their truth, but not a little upon their steadiness, so that no well-meaning

politician can think of proposing any great and sudden innovation in the religious opinions of a state, where the business of life is tolerably conducted; the question naturally arises: in what manner can two such discordant views be best combined; how can we give a proper scope to the progress of knowledge, and yet prevent the state from being injured by premature attempts at innovation?

Posterity may perhaps find out a method of solving this problem in a more perfect manner than any yet known; but as far as human experience has hitherto gone, nothing more efficacious has been devised for this purpose, than what has been long realised in the English constitution. I mean the alliance between church and state.

In

In a nation where the clerical functions are exercised by a separate body of men, there are two extremes into which they will be apt to run, according as their appointments are ordered in one or other of two different ways. If the instructor be dependent for his maintenance upon the good-will of the instructed, the latter will have more attention paid them, and some scope will be given for the progressive improvement of society. But as those improvements will then depend more upon the instructed than the instructor, consequently in a great measure upon men whose time and faculties are much engrossed by their own concerns, this circumstance, together with their want of proper education, will render the changes of public opinion uncertain and fluctuating.

ating. If, on the other hand, public teachers are paid by the state, they will be apt to acquire a distinct character from the rest of mankind; they will be stiff and unbending in their opinions, and doctrines will continue to be uselessly inculcated by words after their spirit has long evaporated, and thus afford matter of scandal to the serious, and of mirth to the gay. Sects will rise up, who will make vain and hurtful efforts to revive the exploded opinions of former ages; men of genius will be speculative infidels, and men of the world practical ones.

Both these disadvantages are in a great measure removed by that alliance between church and state, which exists in this part of our island. The king being at
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the head of the church, without the prejudices of an ecclesiastical education, or any exclusive bias towards church-interests, will be an excellent judge what degree of innovation in public opinion ought to be encouraged or permitted, and when a rigid adherence to antiquated notions becomes the least of two evils. The dignitaries of the church themselves, being by their education men of letters, and by their habits of life men of the world, will unite the characters of those two sets of men. They will have the steadiness of conviction which flows from sound learning, without the obstinate positiveness of mere scholars; they will exhibit the flexibility of the courtier without his fickleness. Devoid of any scholastic attachment

attachment to words and forms, they will admit a liberal interpretation of church-maxims, and yield with discretion to the spirit of the times.

CHAP. IV.

On the Christian Religion in general.

I AM about to engage in a discussion of the greatest importance, but at the same time of the greatest difficulty. I wish to clear up the origin of that religion, a modification of which is at present established in my native country, and of which various shades prevail, and have for centuries past prevailed, in some of the most enlightened nations of the world.

Of

Of most things, which in their progress have astonished mankind by their greatness, or interested them by their utility, the origin is more or less involved in obscurity. The sagacity of man has not hitherto been equal to the task of discovering the tree in the seed, the river in the spring, or the powerful and opulent nation in the feeble colony of indigent emigrants. When Romulus began to erect huts on the banks of the Tyber, none could foresee that they would grow up into a city, destined to conquer, command, civilize and desolate the world. When Jesus began to instruct the Jewish nation, no man could expect that his doctrine would attract sufficient notice to interest mankind in the particulars of its promulgation. From this defect

defect of foresight, it proceeds, that history affords us so little light, when we attempt to investigate, for the benefit of an enlightened and inquisitive age, the origin of such beneficial institutions, as that which is now under consideration. Among the obscure authors of such undertakings, none has either time or abilities to snatch their first steps from oblivion, and the unconnected spectator, who perhaps has both, does not feel himself called upon to perpetuate the memory of what to him seems scarce to deserve the most transient attention.

One difficulty therefore, but by no means the only one attending an enquiry into the origin of Christianity, proceeds from the scantiness of contemporary information. The author of the Christian religion,

religion, like his predecessor Socrates, contented himself with instructing his followers, and illustrating his doctrines by his practice, without committing them to writing for the benefit of posterity ; nor has any historian of that age, unconnected with the Christian society, informed us of any particulars respecting him, besides his public execution, which is cursorily mentioned both by Tacitus and Suetonius. All our knowledge in regard to his birth, parentage, education, private habits, and public actions ; in a word, all that could satisfy biographical curiosity, must be collected from the general history of the times in which he lived, and from one small book, on the contents of which, as it is in every one's hands, I need at present say nothing.

But the embarrassment of an enquirer into the origin of Christianity would be moderate, if the materials afforded him to work upon were merely scanty. Owing to the very peculiar situation in which the first promulgators of that religion were placed, though we cannot greatly doubt their veracity, yet few of the facts related in the book to which I just now alluded can be admitted, without a previous critical examination.

From the accounts, however, that have come down to us, scanty and doubtful as they may be, the biographer of Jesus Christ must derive his information. Happily for him, the contemporary narrators, if they were too poor and too ignorant for historical accuracy, were likewise too simple and too unskilful for

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the tricks of imposture. In their artless tales circumstances escape them, no way essential to their main purpose, but from which the philosopher may strike out lights to direct him in the obscure paths of his researches. Happily for him likewise, so much new light has been lately thrown on the study of human nature, that by applying the principles of that science, in its improved state, to the narratives of the Christian historians, we may not only correct some of their inaccuracies, but likewise fill up several chasms in their histories, in a manner, which if it does not afford satisfaction equal to that derived from more complete histories, will be found sufficient to answer the end of this enquiry, and, as being the best, of which the circumstances

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ces will admit, may hope to be treated with lenity by every candid reader.

This kind of retrospective history is sanctioned by the practice of all ages, and the approbation of the best judges. When we cannot tell exactly what did happen, it is some satisfaction to be told what might have happened. And where there is a sufficient number of facts interspersed to serve as land-marks, the intervals may be so filled up as to satisfy a rational examiner, and the conjectures of the philosopher approach very near to the certainty of the real observer ; more or less near, according to the greater or less perfection of philosophy at the time when such conjectures are formed.

330 ON THE CHRISTIAN RELIGION.

I am inclined to think, that the epic poems of Homer, the Mosaic account of the origin of the world, and some other similar productions, may be considered as theoretical and retrospective histories, as complete as was consistent with the state of philosophy at the time when they were written.

CHAP.

C H A P. V.

On the Character of Christ.

I^N the first place, I shall observe, that the author of Christianity was a genius, and in the next, that he acquired his knowledge in a natural way.

Besides the circumstances mentioned by his biographers, which point out in the clearest manner, that he applied, that he improved, and was admired for his acuteness, till he began to oppose the Jewish religion: besides all this, that Jesus Christ was a genius may be proved

by shewing, that his ideas were arranged after the peculiar manner in which men of genius always arrange their ideas, a peculiarity first pointed out by Dr. Pemberton in the instance of Sir Isaac Newton. This peculiarity consists in a man's classing his ideas for some scientific purpose, generally by the relations of cause and effect, instead of classing them in the way of ordinary men, as they afford means for the attainment of ends, such as power, profit, or pleasure. Men of genius often pursue those ends as well as other people, but not till they have ensured their main purpose of acquiring information, or they do it collaterally, as an occasional digression from their main pursuit,

That

That in this sense of the word our Saviour was a genius, every reader of the gospels must allow. And that he was so upon principle is clear, from his constantly recommending the same plan to others: "Seek ye first the kingdom of heaven and his righteousness, and all other things shall be added unto you:" *i. e.* acquire real knowledge and virtuous habits, and you will never want the means of happiness.

But upon the intellectual powers of Christ I shall speak farther in another chapter. That he acquired his knowledge in a natural way may be proved in the following manner:

If there be any meaning in the word revelation, we must understand by it, a

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supernatural

supernatural infusion of ideas by the immediate power of God, considered as a superior voluntary agent to man, analogous to the knowledge that may be given by one man to another, while the former describes to the latter scenes at which he has been present, but which the other has never seen. God, who is the revealer, must know all things completely. When therefore the person to whom the revelation has been made discloses scenes to which he has never been a witness, these must coincide exactly with the real state of such scenes, as known to those who have seen them. When Baron Swedenborg pretends to have really visited every part of the planetary system, but forgets to visit the Georgium Sidus, we see that he knew nothing of that system, except what was known to other men, and that his

his pretended visit passed only in his own imagination.

In the same manner when Christ condescends to talk of the customs of this world, if he misrepresents them, it is clear that he had no experimental knowledge of them (which we know from other sources,) and it is likewise clear, that his knowledge was not derived from revelation. In the most despotic country that ever was known, a sovereign would not destroy his subjects with the sword, because they had neglected to attend an entertainment to which he had invited them; nor in the freest country, consistent with monarchy, would subjects dare to refuse an invitation sent them by their sovereign. Yet in a well-known parable, both these circumstances are supposed to have happened.

CHAP.

CHAP. VI.

On the Intellectual Powers of Christ.

THE intellectual powers of the author of Christianity had that overstrained character, which is generally termed *great wit*, and which

—to madness surely is allied.

Indeed many passages in the gospels lead me to think, that it sometimes passed the thin partition, and went over into the bounds of its neighbour, *Insanity*.

Not

Not to lay too much stress upon the *ἐκ* of St. Mark, which may certainly mean no more, than that our Saviour was quite jaded with the labour of preaching; his enemies could not with any shew of reason have reproached him with "having a devil," had there not been some foundation for it; for every man, who has ever been of consequence enough to have enemies, must know, that their calumnies, though exaggerations, are seldom absolute falsities. *Ira furor brevis est*; and while the ordinary character of our Saviour is remarkable for its unusual mildness, yet it occasionally goes over into the contrary extreme. In some parts of his speeches, as recorded by St. John, there is a furious positiveness, and an impetuosity of manner, which the above-mentioned contrast serves to render the
more

more striking. "O generation of vipers!
 "Scribes and Pharisees, hypocrites: ye
 "are of your father the devil;" and
 other such-like passages may serve as
 specimens. This temper shewed itself
 in action once, when he lashed away the
 buyers and sellers from the temple. At
 one time, when convicted of a down-
 right contradiction, such as extempore-
 dogmatizers are very apt to fall into, as
 they make frequent use of the *argumen-*
tum ad homines, his only defence was a
 round assertion of his point. "Though
 "I bear witness of myself, yet is my
 "witness true;" directly against his
 general principle, that a man should
 have two vouchers, "besides his own
 "personal one," for his assumed au-
 thority.

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The temptations in the wilderness, upon which Milton has founded his elegant poem of *Paradise Regained*, seem to prove the same point ; for whether we consider the expression itself of “ being tempted by the devil,” or the nature of the temptations related, or the attendant circumstances of fasting a long time, first without, and then with hunger, the true state of the case seems to have been this :

During the long term of eighteen years, in which Jesus lived subject to his parents, it is probable, that like all men of his turn, he was grasping at every opportunity for improving his mind ; and that there were few things he understood less than his father’s business. Having therefore no prospect of maintaining himself

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as a carpenter, and not being rich enough to live without business, we must conclude, that between the admonitions of his father, the cares of his mother, his endeavours to please them, and his wish to follow his own inclinations, he had many an heavy hour. Being known as a lad of uncommon understanding, but confined circumstances, we must suppose, that from caprice, temporary good-humour, and perhaps from real good-will, among several ineligible and captious offers of mending his situation, some of a less exceptionable nature would be made him, all which the pressure of his situation, or his peculiar principles would oblige him to decline. Tired out at last with the different workings of his mind, he would become dejected and melancholy; and anxiety being the predominant feeling,

ing, he would endeavour to escape from it into the desert, where, from the nature of his disorder, he would support fasting for a long time without great inconvenience, but at last be brought to himself by it. Before this lucid period arrived, the diseased state of his body and mind, with the horrors of darkness and solitude, and the general wildness of the scene, would occasion frequent diurnal and nocturnal delusions of imagination, in the course of which the circumstances before-mentioned would naturally occur to him in the shape of infernal temptations. That all this is very likely must be known to every man, whom either reading or experience has made familiar with religious enthusiasts. My reader may rest satisfied, that there are few of the circumstances referred to, which I have not myself seen verified.

It

It is very remarkable, that men much given to speculation or enthusiasm of any kind, especially if they have realized their ideas to any extent, however sound their heads may have been originally, acquire at length a marked mental obliquity ; and there is no way, in which that infirmity is more apt to shew itself, than in fancying themselves possessed of super-human powers. This state of mind is depicted with great justness by Dr. Johnson in the character of the mad astronomer*. The noted Swedenborg was originally a man of superior understanding and information, became in the progress of life a ridiculous visionary, and ended a complete lunatic. Philip of Macedon, who was a man of the most masculine understanding,

* See *Rasselas, Prince of Abyssinia*, Part II. Chap. XL. and the following.

never

never gave a stronger proof of his good sense, than when he guarded against the effects, which his incredible success might have upon his own mind, by contriving to be frequently reminded, that he was but a man. His son Alexander, whose advantages and successes were still greater, shewed himself in this respect inferior, and really gave out that he was a god. It is with reluctance, that I must add to the catalogue of those, who were affected with this over-weening conceit, the sublime Author of Christianity. That he really thought himself a being of a superior order, appears from the whole tenor of his history. Yet he had caution enough, not wantonly to provoke opposition, by proclaiming his pretensions before the world; but could not forbear making them known in private to his select fol-

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lowers.

lowers. He carried his prudential diffimulation so far, that lest, in spite of his silence, conclusions should be drawn from his conduct, he affected to give himself a title, which seemed directly to contradict what he fancied to be his real character, by styling himself the "Son of Man." But notwithstanding this reserve, his private opinion was divulged, and he was under the necessity of defending himself by a temporary interpretation of the obnoxious phrase—"If I have occasionally called myself the Son of God, it was a licence of speech, which I can prove from Scripture to have been no way uncommon."

CHAP. VII.

On the Credit due to the Gospels.

THAT the different lives of Christ which have come down to us, under the names of the Gospels, are no forgeries, has been proved so satisfactorily by Dr. Lardner and others, and their arguments have lately been placed in so clear a light by Dr. Paley, that I shall lose no time upon that head, especially as the same thing must be supported in the strongest manner by internal evidence, to every ingenuous mind capable of reflection, and sufficiently acquainted with the subject.

But still the question arises, how can their wonderful narratives be reconciled to the ordinary course of events? or, are we really to believe, that about the time of Christ the ordinary laws of nature were frequently suspended, in the most capricious manner, for the sake of removing a disease, in some poor obscure individual, or even at times merely by way of exhibition?

There is very strong historical evidence, that those who lived in the first periods of Christianity saw many things performed by Christ and by his followers, which to them appeared wonderful, or, in other words, which could not be accounted for upon the principles of philosophy which were then prevalent. For though I am quite convinced that nothing ever happens,

pens, either in the moral or physical world, but according to the established laws of nature, yet I am not credulous enough to conceive, that all the extraordinary actions recorded of Christ and his apostles are absolute fictions. How then are we to account for such relations? Chiefly, I apprehend, upon the three following principles :

1. In no period of society have all the laws of nature been thoroughly investigated. It has therefore always been possible for men of strong minds, and an independent way of thinking, by their superior knowledge of causes, to produce effects, which could not but greatly surprise the rest of mankind. It is this circumstance which has given rise to the notions of magic, which have prevailed more

or less every where, but always most where there has been the greatest portion of ignorance.

2. The lower we suppose the reigning philosophy to have sunk, the less profound need the acquirements of these wonder-workers to be, in order to produce the effects of astonishment.

3. To attribute effects uniformly to their proper causes is one of the most difficult problems of the human understanding. Events, which happen at the same time, though no way connected, may, by a credulous mind, be believed, and by a designing one represented as being the one the result of the other. Two instances shall be given. The summer is far advanced, and from the raininess of
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the season an indifferent harvest is expected. A priest prays for fair weather; and as he always puts it off as long as possible, the chances that a change must take place are every day more in his favour. Well, the moisture of the atmosphere having exhausted itself by the continual rains, a fair and salubrious season, with an excellent harvest, ensues. The prayers of the priest have been heard, and public thanks are returned.

Another instance. The emperor Aurelian persecutes the Christians, by ordering edicts to be issued against them. A sudden insurrection obliges him to march into Thrace, before they can be issued. He is there assassinated. A

Christian writer * sees in these events the clearest marks of divine interposition: the emperor is punished for his impiety, and the Christians triumph in security. That Aurelian is succeeded by one who immediately renews the persecution, and makes the divine interposition of no effect, is never taken into the account.

Upon these principles we find a ready way of explaining the gradual cessation of miracles in the progress of Christianity. As the number of Christians increases, their superior knowledge becoming more diffused, ceases to surprize; familiarity renders pious frauds more difficult, and the Christians by degrees

* Lactantius.

intermingling

intermingling their notions with those of their Pagan neighbours, a new mode of philosophizing in moral concerns becomes prevalent, which, though superior to Paganism, is inferior to primitive Christianity.

C H A P. VIII.

On Apostolic Inspiration.

IF we examine into the writings and discourses of the Christian apostles, in order to discover what it was that gave them that distinguishing character, which is generally attributed in a vague way to inspiration, we shall find that it consisted in three things, in greater purity of heart, in greater boldness of manner, and in a certain superiority of understanding to ordinary human beings.

The latter circumstance has been peculiarly noticed by Dr. Horsley, in his last charge

charge to the clergy of his diocese. He has even proceeded to remark, with a judgment not easily found except in men no less eminent in learning than in station, that this superiority of understanding in the apostles amounts chiefly to a ready and accurate recollection of the history of their nation, and the universal antiquities of religion; in a word, to a knowledge of every thing to which, in their disadvantageous situation, they had access; adding, that the knowledge conveyed by the Holy Ghost to the understandings of the apostles, was the same in kind, which in the ordinary way is attained in a more imperfect degree by study.

But with all due deference to the learned and every way respectable Bishop, have we no instances, except among the apostles,

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apostles, of men whose minds readily suggested to them all they had ever collected, upon any subject they were discussing, whether it was with a view to the elucidation of a theoretical point, or the advancement of a desirable end, or the persuasion of other minds?

Let me ask the learned Bishop, who is known to be perfectly acquainted with the Newtonian writings; was there any thing in the compass of natural knowledge, as it stood in his day, that did not present itself to the capacious mind of Newton, when he was establishing some law of nature, which his sagacity had previously suggested? Yet his intimate friends inform us, that he was far from being book-learned in proportion to the extent of his knowledge. His ready
invention

invention served him instead of learning.

In my opinion, it is the subject alone which distinguishes the inspiration of Newton from that of the Christian apostles.

Instances are not wanting at present of men who possess the same talents which Newton did, but who apply them to the other purposes before-mentioned, instead of confining them, as Newton did, to theoretical elucidations of natural philosophy; who employ their imaginations in order to suggest to their understandings the several steps necessary towards the advancement of a desirable end, or the several arguments necessary towards the persuasion of other minds. I might even make another distinction, and say that some persons possessed of similar talents, though

though they applied them to moral as well as physical subjects, have still confined themselves to theoretical disquisitions. Such was Locke.

Perhaps it will be objected, that admitting some part of what I advance to be just, still the chief wonder in the case of the apostles remains untouched, to wit, that they should exert themselves as they did, without the help of human learning? Those who thoroughly understand my drift will perceive, that the difference in that respect between Newton, Locke, and the other great men to whom I allude, on the one hand, and the apostles on the other, that this difference is only that of more and less. The moderns whom I have named derived indeed great advantages from their education,

tion, but not with respect to those points for which we chiefly admire them. And even the apostles laid the foundation for their ready application of their own history and antiquities, by studying both in their sacred books. But farther, I think it is probable that Jesus, who was wonderfully sagacious in discerning characters, so that "he needed not that any should testify of man, for he knew what was in man;" that Jesus was not guided by chance alone in the choice of his apostles, but that from several hints he had guessed at their natural strength of mind, and even attainments, before he pronounced the decisive words of "follow me."

But what makes the matter still clearer is, that with all their advantages, the apostles really felt the want of human
 I learning.

learning. I believe Peter possessed every apostolic excellence, except courage, in the most eminent degree; yet no sooner did Paul rise up as a preacher of Christianity, than his superiority became decided, and even excited in Peter's breast some little un-apostolical feelings of jealousy. Paul, we all know, was a kind of scholar; a man who having lost his time and money in sharpening his rhetorical tools, without acquiring much real knowledge, was ready to employ them in the defence of any system that should get possession of his head or heart. In head he was a Jew, and till his heart was converted, opposed Christianity with violence, but was afterwards equally zealous in its defence.

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From the whole of this chapter it appears, that the circumstances into which the Bishop of Rochester has very justly resolved the superior talents of the apostles, are not beyond the natural powers of the human frame; that others have possessed talents of a similar kind, though few have employed them in the same way; that the apostles were by no means without a species of human learning, but still laboured under disadvantages from not possessing more; and that where other apostolic talents were equal, the possession of a greater share of learning always gave a decided superiority.

CHAP. IX.

On the Miracles.

INSTEAD of perplexing my reader and myself with an abstruse disquisition, respecting the nature or possibility of miracles, I shall, in a concise manner, review two of the most important of those which are contained in the narratives of the four evangelists.

We are told, that one day, after having taught the people till it began to be late, Christ, with that humanity which makes so distinguishing a part of his character,

rafter, resolved to feed them too. The story is related by more than one evangelist, with some variation, but without changing the following material circumstances : 1. That the quantity of provision employed was, in the common course of things, quite inadequate to the satisfying the multitude of those who were fed. 2. That they were however satisfied, and had even to spare.

Bearing in mind the particulars already mentioned, by which the narratives contained in the New Testament may be affected, without any impeachment of the historian's veracity, let me ask whether the whole miracle of the loaves and fishes may not be an hyperbolical and allegorical account of an instance of good management. That the distributor had

parimony in his eye, and even *meant* to give a lesson of prudence, appears by the order given by Christ, "to gather up the
"remaining morsels, that nothing be
"lost."

The disposition to exaggeration in the authors of the gospels may be seen exemplified in that enormous hyperbole with which John concludes his history. Jesus acted and taught, says he, so *much*, that were all the particulars to be committed to writing, "our planet," or perhaps "the
"universe, would not be large enough
"to hold so voluminous a work." A man who could hazard such an assertion is capable of asserting any thing.

The transfiguration of Christ is one of the most wonderful stories in the
whole

whole collection. We are informed, that Jesus, accompanied by a select party of his pupils, ascended a mountain ; that there his appearance became changed in a surprising manner ; and that he was seen in converse with Moses and Elijah, two men who had long been dead.

Upon this story however, the simplicity of the narrator has unintentionally thrown great light. He tells us, “ that “ the eyes of the witnesses were heavy “ with sleep ;” and that “ Peter talked “ like one asleep and dreaming :” farther, “ that they kept the story to themselves “ till after Christ’s death :” now no one need be told how *such* stories, in *such* hands, are apt to improve by keeping.

CHAP. X.

On the Scene of Christianity.

THOUGH Christianity sprung up in one of the most remote and least enlightened quarters of the Roman empire, yet it may be easily shewn, that its author had opportunities for acquiring all the knowledge which he ever appears to have possessed. This will be seen, if we consider, first, the state of learning in Judea at the time of our Saviour's birth, and then the character of that celebrated person himself.

In

In one respect it was a great advantage for the future author of a new religion, to be born in Judea. In many provinces of the Roman empire he might indeed have been more easily and more completely initiated in the theoretical learning of the Greeks, and the practical wisdom of the Romans; but that advantage would have been more than compensated by a total exclusion from the important knowledge of the Jews, and the animated philosophy of the eastern nations. In Judea he stood as in a proper centre of observation, and by comparing together the half erroneous opinions of so many different countries, was enabled to strike out from them all, combined with his own experience, a system of ethics far more perfect than any thing that had till then been discovered.

With respect to the talents of our Saviour for acquiring knowledge, I have already shewn that they were very great. I shall here add, that in early life his curiosity in the acquisition of knowledge was as unbounded, as afterwards his humanity in the propagation of it was persevering. And that by means of the sacred books of the Jews, which he thoroughly studied, and his conversations with the Jewish doctors, (who, at a time when the communication between the political and learned world was so extensive, had probably some knowledge of the Greek as well as the Oriental philosophy,) that by these means a sagacity like his could see enough both of the strength and weakness of the reigning notions, to serve as a foundation for his own observation and experience to work upon.

But

But the full proof of these points I am under the necessity of waving for the present, having already swelled this volume to a much greater size than I at first intended.

CHAR.

C H A P. XI.

Conclusion of the Treatise on Christianity.

THE result of all my investigation on this subject, of which some links are necessarily withheld, is, that Jesus Christ was the person who introduced Theism into Europe, as Mahomet, Zoroaster, and Confucius did into Asia. That he was a man of great sagacity, and experimental knowledge of human nature, but not a divine person, in the orthodox sense of that expression. That his doctrines had great merit, but also some imperfections, derived chiefly from the inferiority of his

his station in society; but that with all their defects, they were far superior to any doctrines produced during the æra of Polytheism; and lastly, that there is nothing supernatural, either in the manner of his acquiring his knowledge, or in the success with which his doctrines were propagated after his decease, the source of the former being his personal character, and the cause of the latter the superiority of his views in conjunction with the circumstances of the times.

CHAP. XII.

Conclusion of the whole.

BUT it is now time to put an end to this little work. The novelty of the subject makes it probable that I may be misunderstood, and easy for me to be misrepresented. But such is my consciousness of ingenuousness and impartiality, that if I am really mistaken, in any considerable part of my theory, he who will be at the trouble of pointing out my mistakes, and directing me into the right road, will lay me under the highest obligation, and be entitled to my warmest acknowledgments.

Explanation of the Plate.

FIG. 1. is intended to elucidate the idea of different quantities of power contained in equal spaces. The spaces A and B are equal, and the points contained within them represent points of existence, or powerful points. The area A contains four, and the area B eight in each diameter: the power of the area A is to that of B as 1 : 4.

In Fig. 2. A. a, b, c, d, represents a section of any ordinary body, as explained in the text. A, B, C, D, is the same body moving towards E, with its *Calorique* both in each particle, and in the pores, accumulated at the end, B, D.

In Fig. 2. B. are exhibited three compound particles of an organized and animated body;

body ; 1, 2, 3, are those particles ; and in particle 1, the subordinate particles of which each compound one is made up, are distinguished by the letters A, B, C, D.

To render it more clear I have subjoined the same compound particle 1 upon a larger scale : in both representations *a* is the *Calorique* of composition, and in the small one *b* is the *Calorique* of life.

Here it may be necessary to observe, that the general organization is the only thing intended to be exhibited. That the subordinate particles should be just four in number, and of such or such comparative sizes, is assumed by way of illustration. The real number and sizes are probably very various in different cases, and if at all necessary to be known, must be referred to the chemist and physiologist to determine between them. To me the question appears to be of no importance.

Fig.

Fig. 3. requires no explanation.

In Fig. 4 and 5. I exhibit a very rude sketch of the human circulation, in which, to simplify the matter, I have supposed only one artery and one vein to exist.

A is the right ventricle of the heart.

B the left ventricle. At

C the passage from the right to the left, through the lungs, is just hinted at by a dotted line.

D is a vein.

E is an artery.

F the place where the artery goes over into the vein.

In Fig. 5. there is added, at G a portion of that cellular substance, in which the secretions are formed; the bases entering by the open ends from the air, and the *Calorique* issuing through the sides of the blood-vessels.

In

In Fig. 6 and 7. are exhibited two rude representations of an human brain, cut transversely from the forehead to the back of the head.

A, B, C, are the boundaries of the section.

D, E, F, G, in both figures, are ideas.

D in Fig. 6. is excited; in Fig. 7. it is unexcited.



Fig. 1.

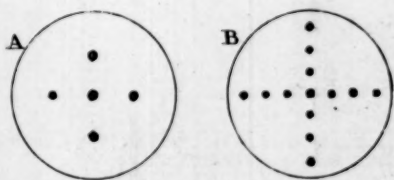


Fig. 2. A.

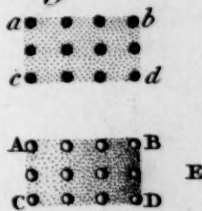


Fig. 2. B.

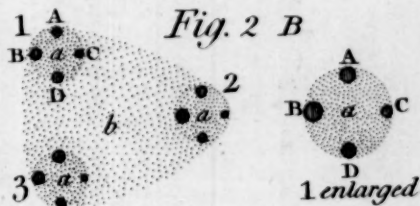


Fig. 3.



Fig. 4.



Fig. 5.

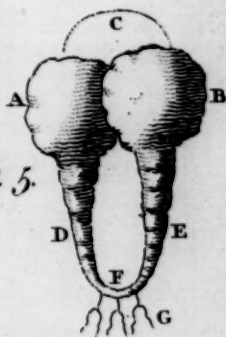


Fig. 6.

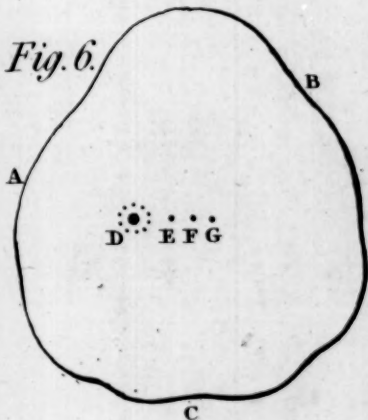


Fig. 7.

